
IMPLATS
Distinctly Platinum

# Mineral Resource and Mineral Reserve Statement 2017

Supplement to the Annual Integrated Report 30 June 2017

Implats embraces an integrated Mineral Resources Management (MRM) function. To this end, systems, procedures and practices are aligned and are continuously being improved to achieve this objective. MRM includes exploration, geology, geostatistical modelling and evaluation, mine surveying, sampling, mine planning, ore accounting and reconciliation and the MRM information systems.

Implats exploits platiniferous horizons within the Bushveld Complex in South Africa and the Great Dyke in Zimbabwe. These two layered intrusions are unique in terms of size and geological continuity. Mining mostly takes place as underground operations focusing on relatively narrow mineralised horizons, with specific mining methods adapted to suit the local geology and morphology of the mineralised horizons.

# Welcome to our 2017 Mineral Resource and Mineral Reserve report



The most significant PGM deposits in the world are located in the Bushveld Complex in South Africa and the Great Dyke in Zimbabwe. These PGM deposits contribute around three-quarters of global platinum output.

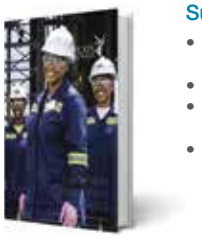
Additional information regarding Implats is provided in the following reports, all of which are available at www.implats.co.za

### Integrated Report

- Information about our stakeholders, their material matters, risk, strategy and performance
- Information about our operations, Mineral Reserves and Mineral Resources, business context, environment, business model, and intellectual capital contained in our risk and remuneration processes
- Overall assurance provided explained

### Annual Financial Statements

These annual financial statements were prepared according to International Financial Reporting Standards (IFRS) of the International Accounting Standards Board (IASB), the SAICA Financial Reporting Guides as issued by the Accounting Practices Committee and Financial Reporting Pronouncements as issued by the Financial Reporting Standards Council, the requirements of the South African Companies Act, Act 71 of 2008, the Listings Requirements of the JSE Limited and the recommendations of King IV.



### Sustainable Development Report

- Detail on material economic, social and environmental performance
- GRI G4 core compliance
- Internal reporting guidelines in line with the UN Global Compacts
- Independent assurance report

**FEEDBACK**

We welcome your feedback to make sure we are covering the things that matter to you.

Go to **www.implats.co.za**
or email **investor@implats.co.za**
for the feedback form, or scan the code on the left with your smart device.

# The report

Impala Platinum Holdings Limited (Implats) is one of the world's foremost producers of platinum and associated platinum group metals (PGMs). Implats is structured around five main operations with a total of 19 underground shafts. Our operations are located within the Bushveld Complex in South Africa and the Great Dyke in Zimbabwe, the two most significant PGM-bearing orebodies in the world.

Implats has its listing on the JSE Limited (JSE) in South Africa, the Frankfurt Stock Exchange (2022 US$ convertible bonds) and a level 1 American Depositary Receipt programme in the United States of America. Our headquarters are in Johannesburg and the five main operations are Impala, Zimplats, Marula, Mimosa and Two Rivers. The structure of our operating framework allows for each of our operations to establish and maintain close relationships with their stakeholders while operating within a Group-wide approach to managing the economic, social and environmental aspects of sustainability.

The report relates to the Mineral Resource and Mineral Reserve Statement, compiled for Implats and its subsidiaries and provides the status as at 30 June 2017. An abridged version is included in the Implats integrated annual report for 2017 which is published annually and available at **www.implats.co.za**.

The report seeks to provide transparent and compliant details relating to the Mineral Resources and Mineral Reserves that are considered to be material to stakeholders.

**Forward looking statements**
This report contains certain forward looking statements and forecasts which involve risk and uncertainty because they relate to events and depend on circumstances that occur in the future. There are a number of factors that could cause actual results or developments to differ materially from those expressed or implied by these forward looking statements.

# Implats Mineral Resource and Mineral Reserve Statement 2017 at a glance

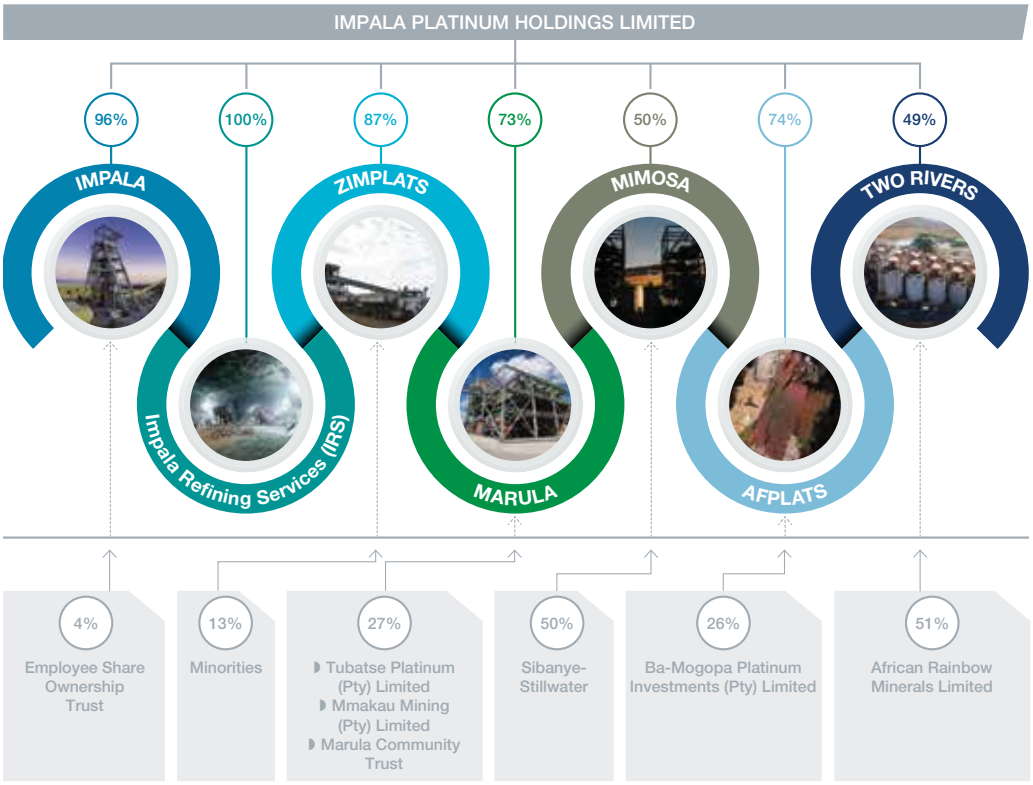
## Perspective

The Mineral Resource and Mineral Reserve Statement as at 30 June 2017 is collated at a time when the platinum industry faces significant external challenges. The prevailing depressed metal prices are reflected in the fact that capital investment has virtually dried up throughout the industry. At Implats, greenfields exploration has been terminated and shaft sinking operations at Impala's 17 Shaft and Afplats' Leeuwkop Shaft remain suspended. Despite the difficult circumstances some operations continue to deliver strong production performances with a positive outlook to grow the Mineral Reserve inventory at Zimplats, Mimosa and Two Rivers.

## Group operations

The Implats structure remained unchanged during the past year with operations at Impala in the Rustenburg area of the North West province, the refinery at Springs in the Gauteng province, the Marula Mine in the Limpopo province, Zimplats and Mimosa Mines operating in Zimbabwe, the Two Rivers Mine near Burgersfort in the Limpopo province and the Afplats project near Brits in the North West province.

## Group structure




## Headline numbers

(for more details see pages 32 and 35)

### Attributable estimates

| | | 2017 | 2016 |
|---|---|---|---|
| Mineral Resources* | Moz Pt | **191.6** | 194.0 |
| | Moz 4E | **360.4** | 364.9 |
| | Mt | **2 787** | 2 741 |
| Mineral Reserves | Moz Pt | **22.4** | 21.6 |
| | Moz 4E | **41.0** | 38.9 |
| | Mt | **358** | 329 |

** Mineral Resource estimates are inclusive of Mineral Reserves.*

# Implats Mineral Resource and Mineral Reserve Statement 2017 at a glance

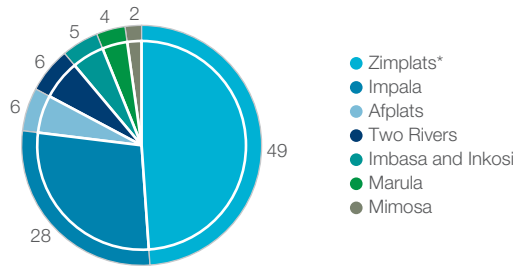
**Summary Mineral Resources**
(for more detail see page 32)

There is no material change in the attributable Mineral Resource estimate which reduced by 2.4Moz Pt. This estimate is dominated by Zimplats and Impala, with Zimplats accounting for 49% of the total attributable Mineral Resources.

### Attributable Mineral Resources


### Attributable Mineral Resources of 191.6Moz Pt (%)

as at 30 June 2017

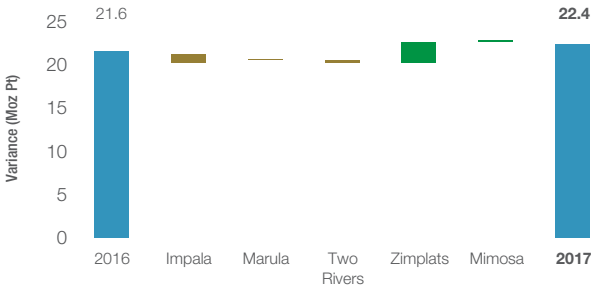



** Zimplats' Mineral Resources will reduce by approximately 54Moz Pt if the GoZ is successful in obtaining the ground north of Portal 10.*

**Summary Mineral Reserves**
(for more detail see page 35)

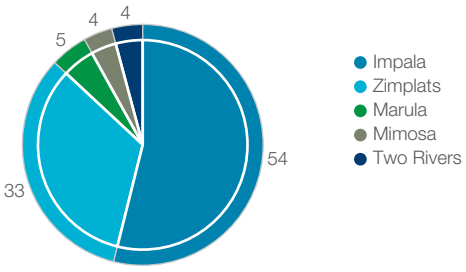
Overall the attributable Group Mineral Reserve estimate did not change significantly and increased by 0.8Moz Pt to 22.4Moz Pt. Some 54% of the attributable Mineral Reserves (Pt) is located at Impala and a further 33% is hosted within the Main Sulphide Zone at Zimplats.

### Attributable Mineral Reserves




### Attributable Mineral Reserves of 22.4Moz Pt (%)

as at 30 June 2017




**Mineral rights**
(for more detail see page 16)

All mineral rights are in good standing without any known impediments. The Zimbabwean government (GoZ) has been pursuing greater participation in the mining sector by indigenous Zimbabweans. The Zimbabwe policy position on indigenisation was clarified in the 11 April 2016 policy statement, but there are ongoing discussions with the GoZ regarding indigenisation implementation plans for Zimplats and Mimosa. Depending on what position is ultimately taken by the GoZ, Implats' attributable Mineral Resources and Mineral Reserves may be reduced. During 2013, the GoZ gazetted its intention to compulsorily acquire a large tract of ground in the northern portion of the Zimplats mineral lease, containing some 54Moz Pt. Such notice was subsequently reissued and at 30 June 2017, there has been no conclusion to this matter. Zimplats agreed in principle to release the bulk of the area subject to certain conditions and is seeking to have the matter solved amicably.

**Compliance**
(for more detail see page 10)

The Mineral Resource and Mineral Reserve Statement is compiled in accordance with guidelines and principles of the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (SAMREC Code), the South African Code for the Reporting of Mineral Asset Valuation (SAMVAL Code) and Section 12.11 of the JSE Listings Requirements as updated from time to time. Supporting documentation includes detailed internal reports, SAMREC Table 1 reports, and regular third-party reviews. A summary list of Competent Persons who compiled this report is included in this document. While Zimplats complies to guidelines and principles of the JORC Code, the definitions are either similar or do not vary materially from the SAMREC Code.

# Implats Mineral Resource and Mineral Reserve Statement 2017 at a glance

**The SAMREC Code**
(for more detail see page 10)

Implats subscribes to the principles of the SAMREC Code of transparency, materiality and competency. The overarching strategic key focus areas of Implats are:

- Maintaining prudent investment through the cycle
- Maintaining strategic optionality and positioning the Group for the future
- Improving efficiencies/profitability through operational excellence and safe production
- Conserving cash, especially while metal prices remain depressed
- Maintaining our social licence to operate.

**Key criteria**
(for more detail see page 27)

- Mineral Resources are reported inclusive of Mineral Reserves unless otherwise stated
- There are no Inferred Mineral Resources included in any of the Mineral Reserve estimates
- Mineral Resources are only converted to Mineral Reserves once a feasibility study has been concluded and the new project or existing mine has been budgeted for and approved by the Implats board
- The Mineral Resource Statements remain, in principle, imprecise and must not be seen as calculations. Rounding-off of figures may result in minor discrepancies
- The Mineral Resources and Mineral Reserves are estimated as at 30 June 2017 and will be affected by changes in the metal prices, exchange rates, operating parameters, cost and performance, permitting and potential changes in legislation
- The feasibility study of the next portal (Portal 6), a replacement for Portals 1 and 2, at Zimplats was completed. The project was approved by the board and construction has commenced
- The Mineral Resources and Mineral Reserves are estimated for the PGMs (excluding osmium) and gold only, while some details of the other by-products are mentioned.

**Long-term price assumptions**
(for more detail see page 30)

Long-term price assumptions in today's money*

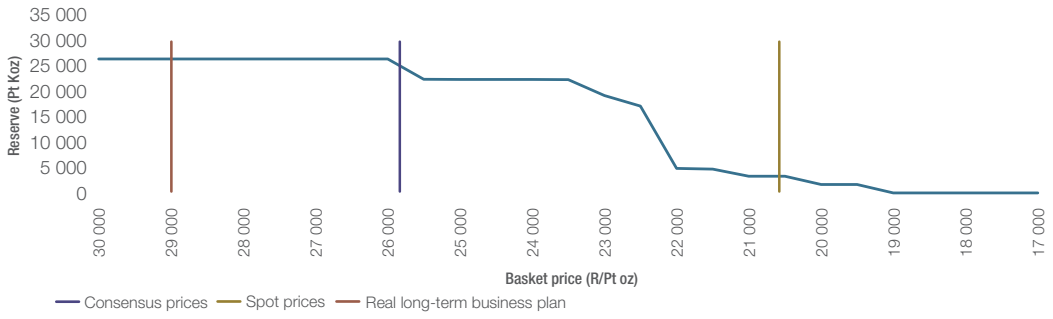
| | | |
|---|---|---|
| Platinum | US$/oz | **1 300** |
| Palladium | US$/oz | **900** |
| Rhodium | US$/oz | **1 100** |
| Ruthenium | US$/oz | **55** |
| Iridium | US$/oz | **630** |
| Gold | US$/oz | **1 100** |
| Nickel | US$/t | **14 000** |
| Copper | US$/t | **6 700** |
| Exchange rate | R/US$ | **13.88** |
| Basket | US$/Pt oz | **2 100** |
| | R/Pt oz | **29 100** |

** Supporting Mineral Reserve estimates.*

**Mineral Reserve sensitivity**
(for more detail see page 30)

Rigorous profitability tests are conducted to test the viability of the Mineral Reserves. A summary graph showing the price sensitivity of the total Group Mineral Reserves is depicted below.

**Implats Mineral Reserves vs real basket price**




**General Implats numbers at 30 June 2017**
(for more details see Implats Integrated Report 2017 at **www.implats.co.za**)

FIFR
**0.074**

TIFR
**13.14**

Refined Pt production
**1 529 800oz**

Headline loss
**R983 million**

Net cash from operating activities
**R1 013 million**

Capital expenditure
**R3 434 million**

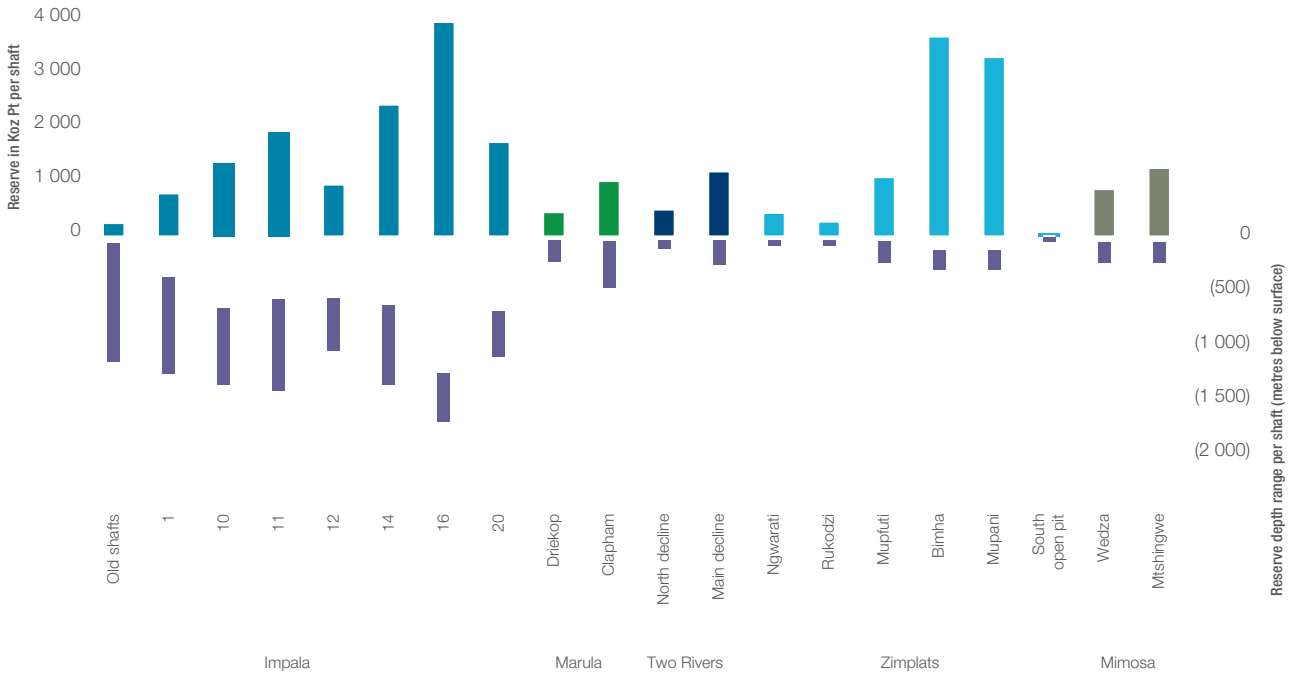
Attributable Mineral Resources (Pt ounces)
**192Moz**

Number of employees
**52 012**

# Implats Mineral Resource and Mineral Reserve Statement 2017 at a glance

The updated allocation of Implats' Mineral Reserves per shaft infrastructure as at 30 June 2017 is depicted in the accompanying graphic illustration. The range below surface and quantum relating to the infrastructure is shown and depicts among others the advantage at Zimplats in this regard. This graph also gives an indication of the potential impact of a possible shaft closure in future should prices demand this.

**Platinum Mineral Reserve and depth range for individual Implats shafts**




*Geologists discussing geological structures*

# Integrated Mineral Resource management

Implats embraces an integrated Mineral Resources management (MRM) function. To this end, systems, procedures and practices are aligned and are continuously being improved to achieve this objective. MRM includes exploration, geology, geostatistical modelling and evaluation, mine surveying, sampling, mine planning, ore accounting and reconciliation and the MRM information systems. The MRM function is the custodian of the mineral assets and specifically strives to optimise these assets – in terms of both Mineral Resources and Mineral Reserves – and to unlock value through a constant search for optimal extraction plans which yield returns in line with the corporate and business objectives.

The main objective of the MRM function is to support the strategic intent and add value to the organisation through:

- Ensuring that safe production is the first principle underpinning all Mineral Reserve estimates
- Appropriate investigation, interpretation and understanding of the orebodies
- Integrated and credible short-, medium- and long-term plans
- Measured and managed outputs
- Technically appropriate and proven management information systems
- Accurate and reconcilable Mineral Resource and Mineral Reserve estimates
- Seek optimal solutions to ensure sustainable and profitable operations.

Continuous improvement has been embedded in the MRM function. Specific focus is given to new learnings, standardisation and protocols as well as collaboration with the industry. Implats accordingly remains committed to the following:

- Continuously improving the management of Mineral Resources and related processes
- Optimal exploitation of current assets, together with growth of the Mineral Resource base by leveraging and optimising existing Implats properties, exploration and acquisitions, including alliances and equity interests with third parties and the legislative regime that governs mineral rights ownership
- The transparent, responsible and compliant disclosure of Mineral Resources and Mineral Reserves in line with the relevant prescribed codes as updated from time to time – SAMREC, SAMVAL and JORC – giving due cognisance to materiality, transparency and competency.

Present focus areas include:

- Improved Mineral Reserve flexibility, measured as mineable face length in conventional mining sections, with specific focus on 16 and 20 Shafts at Impala
- Improvement in the quality of mining
- Revisiting optionality of long-term planning in view of present cash constraints
- Scenario planning for LoM II and III Mineral Resources to ensure a sustainable business model
- Improving the MRM information systems in cooperation with third-party vendors, in particular to improve mine planning
- Work streams to ensure optionality to sustain operations in the future.

**GROUP STRATEGY: Positive long-term fundamentals, expect lower for longer prices**

| Investment through the cycle | Maintain optionality and position for the future | Operational excellence | Cash conservation | Maintain licence to operate |
|---|---|---|---|---|

**MRM FOCUS AREAS**

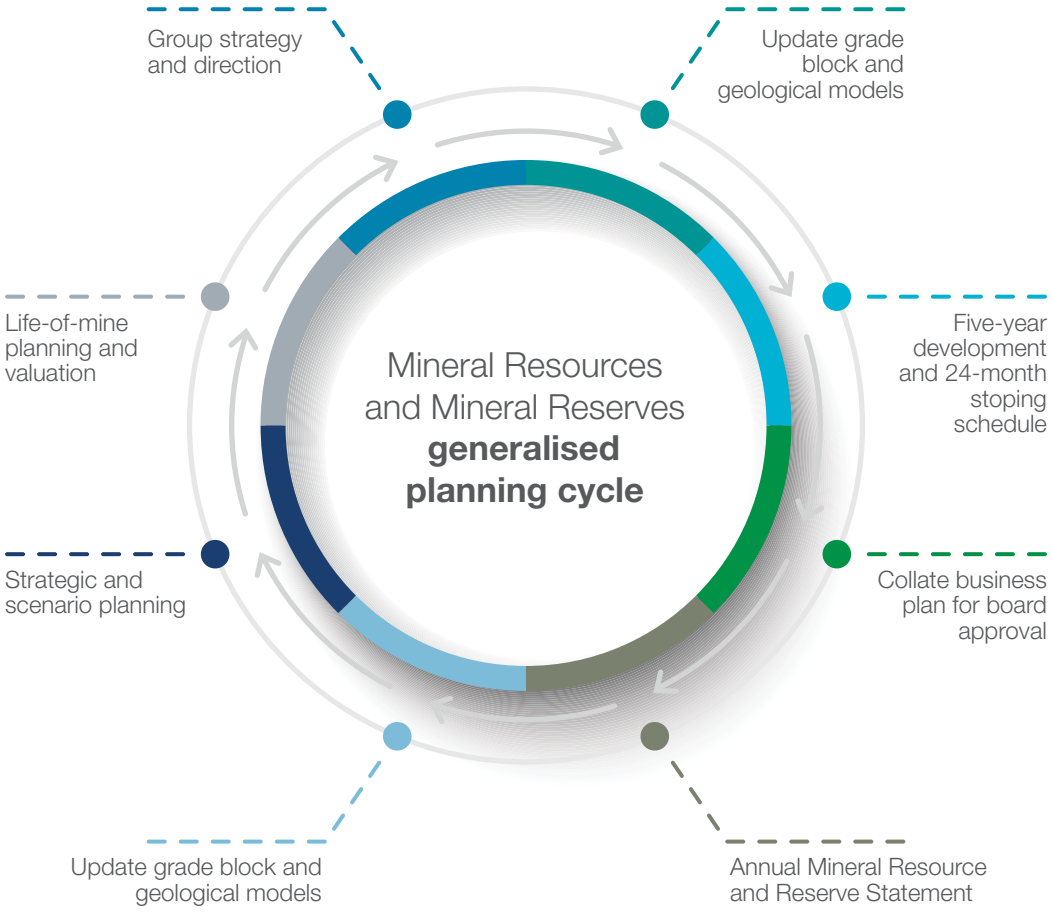
| | |
|---|---|
| Geological information | • Timeous brownfields exploration<br>• Cost-effective infill surface drilling<br>• Optimal underground drilling<br>• Observation tools |
| Quality mining | • Grade reviews, action plans<br>• Face observations, issue stop notes<br>• Grade control observers<br>• Improved dashboards |
| Mining flexibility | • Detailed development scheduling<br>• Development tracking<br>• Redevelopment and panel establishment<br>• Face length management |
| Systems | • MineRP CAD<br>• MineRP SpatialDB and SpatialDash<br>• 3D geological Datamine Strat3D geological modelling<br>• MineRP Planner |
| Optionality | • Optimal utilisation of current infrastructure<br>• Expanding the footprint of current shafts<br>• Scenarios for future sustainability<br>• M&A opportunities |

# Mine planning

The main objectives of the Implats' integrated mine planning cycle have remained as follows:

- To use the full available time per year for quality planning
- To allow integration of the different levels of planning
- To ensure the planning levels are done in the correct sequence
- To populate the cycle with appropriate review processes
- To link the planning cycle to business reporting periods
- To provide continuity of plans and cycles
- To place emphasis on risk and value
- To identify departmental inputs and ensure full participation
- To ensure changes in the business environment are continuously incorporated
- To ensure top-down goals flow through to operational planning and vice versa
- To ensure the optimisation of plans
- To enhance compliance with standards, consolidation and delivery of results.

The planning cycle is now embedded to give due consideration to the sequence of planning, the duration of the business planning period and the embedding of long-term strategic planning. It commences with updating the life-of-mine (LoM) plans in October, followed by a detailed five-year development and two-year stoping scheduling phase in February and March. Through the LoM process, the previous LoM plans and performances, shaft tails and also capital requirements, the ramp-up of projects, the portfolio of assets, market demand, price projections and options are examined. This is followed by the reconciliation of the Mineral Resources and Mineral Reserves at mid-year. The reconciliation is updated towards year end in May/June leading to the commencement of the next cycle starting in July/August. The main benefit of this approach is the smooth flow and transition from LoM planning to the detailed business plan. Targets for the detailed two-year plan flow from the LoM profiles. The detailed planning phase is completed as late as possible in the cycle, to allow the minimum possible period before the subsequent production year commences and to ensure proper alignment with the delivery phase of the plan, that commences in July. The planning cycle is fully integrated in the MRM work flow and management. The generalised planning cycle is shown below. It must be noted that rework or new activities are accommodated out of the normal cycle.



# Mine planning

Implats has defined three levels of LoM planning, these being classified as Levels III, II and I, which also illustrates a broad alignment with Mineral Resource and Mineral Reserve categories. The three levels are linked to increasing levels of confidence and the conversion of Mineral Resources to Mineral Reserves.

**LoM Level III** includes "Blue Sky" and scoping studies and therefore focuses mainly on Inferred Resources and exploration results. It also includes contiguous areas and opportunities outside existing lease boundaries and ownership. Valuation of these resources can only be done internally, to justify expenditure for the upgrading of the Inferred Resources.

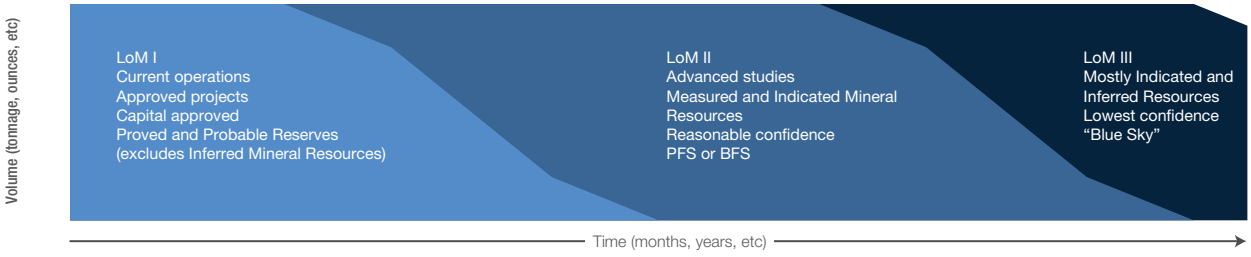
**LoM Level II** includes planned but as yet unapproved projects, which have a reasonable chance of future board approval.

**LoM Level I** includes operational shafts and approved capital projects where a portion of Mineral Resources is converted to Mineral Reserves and sufficient confidence exists for the declaration of Mineral Reserves in a public report. To this effect no Inferred Mineral Resources are included in LoM I.

While the different LoM II and III profiles are depicted for each operation in the detailed sections, future investments at Impala beyond current infrastructure will at best be marginal (see page 30).

**LoM planning levels**

Illustration of levels of planning




Estimation of grade block models is facilitated by geostatistical packages, based on a fit-for-purpose principle. Mine design and scheduling use 3D planning tools, the output of which supports the Mineral Reserve estimates. Grade and tonnage modifying factors are stored in electronic databases. The planning process involves the conversion of Mineral Resources to Mineral Reserves through the allocation of modifying factors to the *in situ* Mineral Resource, as well as through detailed design and scheduling work. Factors used include densities per rock type and dimensions appropriate to the mining method deployed. In some cases the mineralised channel is narrower than the minimum mining width and additional waste material has to be included in the mining cut. Historical dilution factors are incorporated into the plan taking into account anticipated future conditions and improvements where possible. Dilution factors used include overbreaks, underbreaks and off-reef mining. Cognisance is taken of the practicalities of hard rock mining and the limitations of the tools used. This is allocated on a mining area basis, which allows the varying conditions across the lease area to be recognised and integrated into the LoM plan. Where there is no history, factors from similar operations are used as a guideline. Planning parameters are informed in part by historic and anticipated future constraints.

The graphical plans depicting the planned layouts, designs and sequence of mining are compiled and approved by the mining and technical services management of each mining area. These profiles are further endorsed by the technical services and general managers. Ownership of the business plans are recorded by detailed approval, acceptance and sign-off of the production schedules at various levels at the operations and by senior management.

# Compliance

The reporting of Mineral Resources and Mineral Reserves for Implats' South African operations is undertaken in accordance with the principles and guidelines of the SAMREC Code. SAMREC was established in 1998 and modelled its code on the Australasian Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (JORC Code). The first version of the SAMREC Code was issued in March 2000 and adopted by the JSE in its Listings Requirements later in the same year; this was similarly the basis for the JSE Ongoing Reporting Requirements which were promulgated in 2005. The SAMREC Code has been under review since 2004 and was updated in the 2007 edition and amended in July 2009. The SAMREC Code has recently been updated and supersedes the previous editions of the code; this was launched on 19 May 2016 at the JSE. Section 12.11 of the JSE Listings Requirements has been updated and the revised SAMREC and SAMVAL Codes came into effect on 1 January 2017. Zimplats, as an Australian Securities Exchange (ASX) listed company, reports its Mineral Resources and Mineral Reserves in accordance with the 2012 JORC Code. The definitions contained in the SAMREC Code are either identical to or not materially different from the JORC Code. Mimosa Investments Limited, a Mauritius-based company, does not fall under any regulatory reporting code, but has adopted the SAMREC Code for its reporting.

The new edition of the SAMREC Code includes an updated Table 1 template, which provides an extended list of the main criteria that must be considered and reported when reporting on exploration results, Mineral Resources and Mineral Reserves. In the context of complying with the principles of the code, comments relating to the items in the relevant sections of Table 1 must be provided on an 'if not, why not' basis within the Competent Person's report. The guidelines for the compilation of Table 1 is for (i) the first-time declaration of exploration results, a Mineral Resource or a Mineral Reserve, and (ii) in instances where these items have materially changed from when they were last publicly reported for significant projects. Reporting on an 'if not, why not' basis ensures that it is clear to an investor or other stakeholders whether items have been considered and deemed of low consequence or are not yet addressed or resolved. Implats has adopted the compilation and updating of Table 1 as a standard to complement internal reports.

Concurrent with the evolution of the SAMREC Code, the Committee for Mineral Reserves International Reporting Standards (CRIRSCO) has, since 1994, been working to create a set of standard definitions for the reporting of Mineral Resources and Mineral Reserves. The definitions in the 2016 edition of the SAMREC Code are either identical to, or not materially different from, those existing standard definitions published in the CRIRSCO Reporting Template 2013.

Various Competent Persons (CPs), as defined by the SAMREC and JORC Codes, have contributed to the estimation and summary of the Mineral Resource and Mineral Reserve figures quoted in this report. As such, these statements reflect the estimates as compiled by teams of professional practitioners from the various operations and shafts.

Gerhard Potgieter, Group Consulting Mining Engineer, PrEng, ECSA Registration No 20030236, and a full-time employee of Implats, takes full responsibility for the Mineral Reserve estimates for the Group. The Competent Person has 32 years' relevant mining experience.

The Group Executive: MRM, Seef Vermaak, PrSciNat, SACNASP Registration No 400015/88, a full-time employee of Implats, assumes responsibility for the Mineral Resource estimates for the Implats Group. He also assumes responsibility for the collation of the combined Mineral Resource and Mineral Reserve Statement for the Group. The Competent Person has 31 years' experience in the exploitation of PGM-bearing deposits.

Implats has written confirmation from the Lead Competent Persons that the information disclosed in terms of this document are compliant with the SAMREC Code and, where applicable, the relevant JSE Section 12 and SAMREC Table 1 requirements, and that it may be published in the form, format and context in which it was intended.

The address for ECSA is:
Engineering Council of South Africa (ECSA),
Private Bag X691, Bruma, 2026, Gauteng province,
South Africa.

The address for SACNASP is:
South African Council for Natural Scientific Professions,
(SACNASP), Private Bag X540, Silverton, 0127,
Gauteng province, South Africa.

# Compliance

The contact details of the Lead Competent Persons are as follows:

**Gerhard Potgieter**
ECSA 20030236, SAIMM
Lead Competent Person
Group Consulting Mining Engineer
Impala Platinum Limited
2 Fricker Road
Illovo, 2196
Private Bag X18
Northlands, 2116

10 September 2017

**Seef Vermaak**
SACNASP 400015/88, GSSA
Lead Competent Person
Group Executive, Mineral Resource Management
Impala Platinum Limited
2 Fricker Road
Illovo, 2196
Private Bag X18
Northlands, 2116

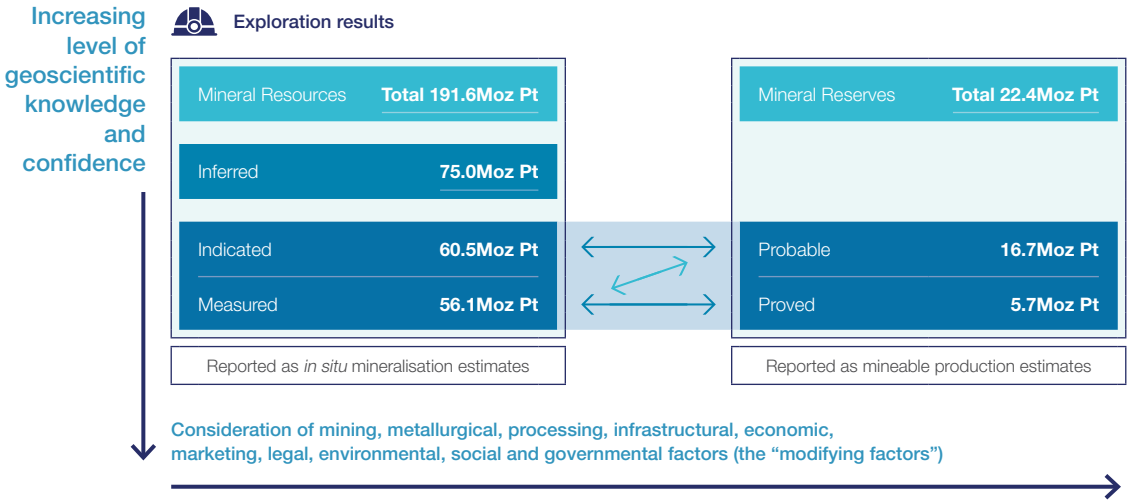
10 September 2017

A Competent Valuator (CV) is a person who is registered with ECSA, SACNASP, or SAGC, or is a Member or Fellow of the SAIMM, the GSSA, SAICA, or a Recognised Professional Organisation (RPO) or other organisations recognised by the SSC on behalf of the JSE. A Competent Valuator is a person who possesses the necessary qualifications, ability and relevant experience in valuing mineral assets. A person called upon to act as a Competent Valuator shall be clearly satisfied in their own mind that they are able to face their peers and demonstrate competence in the valuation undertaken.

Nico Strydom, CA(SA), ACMA, Group strategy and new business development manager, a full-time employee of Implats, takes full responsibility for the valuation of the Mineral Resources and Mineral Reserves for the Group.

The Implats Group's attributable platinum ounces are reflected in the illustration below.

**Relationship between exploration results, Mineral Resources and Mineral Reserves showing Implats' attributable Mineral Resources and Mineral Reserves as at 30 June 2017 (Moz Pt)**



# Compliance

## Competent Person (CP) structure 2017

- **Lead CP Mineral Resources: Seef Vermaak, Group Executive MRM, (SACNASP 400015/88), GSSA**
- **Lead CP Mineral Reserves: Gerhard Potgieter, Group Consulting Mining Engineer (ECSA 20030236), SAIMM**

| Competent Person's (CP) name | Appointment | Registration |
|---|---|---|
| Bennie Cilliers | Lead CP exploration | SACNASP, GSSA |
| Louise Fouché | Lead CP geostatistics and databases | SACNASP, SAIMM, GSSA |
| Johannes du Plessis | Lead CP audits, reconciliation | SACNASP, GSSA |
| David Sharpe | Lead CP mine planning | SACNASP, GSSA |
| Coenie Pretorius | Lead CP survey and ore accounting | SAGC, IMSSA |
| Stanley Claassen | Lead CP standards and processes of mine planning | SACNASP |
| Nico Strydom | Lead CP valuation | SAICA, CIMA |

| Unit/Project | CP Mineral Resources | Registration | CP Mineral Reserves | Registration |
|---|---|---|---|---|
| Afplats/Imbasa/Inkosi | Jacolene de Klerk | SACNASP, GSSA | n/a | |
| Marula | Sifiso Mthethwa | SACNASP, GSSA | Sifiso Mthethwa | SACNASP, GSSA |
| Zimplats | Steven Duma | AusIMM, SACNASP | Caston Mutevhe | ECSA, SAIMM |
| Impala | Johannes du Plessis | SACNASP, GSSA | David Sharpe | SACNASP, GSSA |
| Impala Exploration/Projects | Bennie Cilliers | SACNASP, GSSA | n/a | |
| Two Rivers | Shepherd Kadzviti | SACNASP, GSSA | Mike Cowell | SACNASP, GSSA |
| Mimosa | Dumisayi Mapundu | SACNASP | Dumisayi Mapundu | SACNASP |

*Two Rivers, Mimosa and Zimplats CPs are appointed by their respective CEOs.*

In addition to the CPs listed above, the Mineral Reserve Statements are fully supported by an experienced team of general managers, who approve their respective business plans and take full responsibility for their Mineral Reserve Statements. The general managers are:

| Name | Area of responsibility | Years' relevant experience |
|---|---|---|
| Terence Cowley | General manager Impala 1 Shaft | 34 |
| Hobson Jantjies | General manager Impala 9 and 10 Shafts | 30 |
| Riaan Swanepoel | General manager Impala 11 Shaft | 27 |
| Zirk Fourie | General manager Impala 20 Shaft | 30 |
| Joseph Tsiloane | General manager Impala 4, EF, 6 and 12 Shafts | 17 |
| André Fryer | General manager Impala 14 Shaft | 18 |
| Hans Fourie | General manager Impala 16 Shaft | 29 |
| Jacey Kruger | General manager Impala Projects | 27 |
| Mogale Mashilane | General manager Marula Mine | 25 |
| Alex Mushonhiwa | General manager Mimosa Mine | 24 |
| Simbarashe Goto | Senior general manager Ngezi Mine | 20 |
| JJ Joubert | General manager Two Rivers Mine | 26 |

# Auditing and risk

Implats is committed to independent third-party reviews to provide assurance regarding the Mineral Resource and Mineral Reserve estimates. Furthermore, these reviews assist with the principle of continuous improvement on the set internal processes. The Mineral Corporation was contracted to review and audit the Group's Mineral Resources and Mineral Reserves for three consecutive years. The first audit was undertaken in 2016 and the second one during the past year. The main focus areas of the audits was to conduct spot checks of estimates and to link this through to the Mineral Resources and Mineral Reserves, the LoM profiles and the financial valuation of LoM models. They are also tasked to provide guidance in terms of the 2016 SAMREC edition, Table 1 and improvements to the Mineral Resources and Reserves public statement.

The 2017 audit concluded that there are no apparent fatal flaws or material issues identified in the Mineral Resource and Reserve estimation processes and technical modifying factors for the PGM mining operations audited. The review indicated that Mineral Resource and Reserve Statements for Implats' operations as at 30 June 2017 have been compiled and reported following the guidelines of the 2016 editions of the South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves (the SAMREC Code) and the 2012 Edition of the Australasian Code for Reporting of Exploration Results, Mineral Resources and Ore Reserves (the JORC Code). Overall, the processes followed in compiling the estimates and the sign-off procedures fulfil the requirements of Implats' Code of Practice for the Estimation, Classification and Reporting of Mineral Resources and Reserves. The audit noted that the economic viability testing of the LoM plans completed was based on reasonably assumed forward-looking metal price, exchange rate and discount rate assumptions, and realistic production schedules. A statement from The Mineral Corporation is included on page 15.

At Mimosa a third-party review of the Mineral Resource and Mineral Reserve estimates and the LoM planning process was undertaken by The Mineral Corporation independent from the Implats Group-wide audit at the request of the shareholders. No material issues were identified that would prevent the LoM schedule from being reported as Mineral Reserves. However, The Mineral Corporation recommended that the practice of tail management is applied. It was further concluded that the upgrading of Probable to Proved Mineral Reserves and conversion of Indicated Mineral Resources to Probable Mineral Reserves in the Mtshingwe area is appropriate.

The Group's reported Mineral Reserves, and its reported Mineral Resources represent its estimate of quantities of PGMs that have the potential to be economically mined and refined under anticipated geological and economic conditions. There are numerous uncertainties inherent in estimating quantities of Mineral Resources and Mineral Reserves as well as in projecting potential future rates of mineral production, coupled with many factors beyond the Group's control. The accuracy of any Mineral Resources and Mineral Reserves estimate is a function of a number of factors, including the quality of the methodologies employed, the quality and quantity of available data, geological interpretation and judgement. It is also dependent on economic conditions that are in line with estimates. Further, estimates of different geologists and mining engineers may vary and the results of the Group's mining and production – subsequent to the date of an estimate – may lead to a revision of estimates. This can be due to fluctuations in the market price of ores and metals, reduced recovery rates or increased production costs due to inflation or other factors, which may render Mineral Resources and Mineral Reserves containing lower grades of mineralisation uneconomic to exploit and may ultimately result in a restatement of Mineral Resources and/or Mineral Reserves, which could then adversely impact future cash flows. Mineral estimates are based on limited sampling and, consequently, are uncertain as the samples may not be representative of the entire orebody and Mineral Resource. As the understanding of the orebody improves, the estimates may also change. In addition, the Mineral Reserves the Group ultimately exploits may not conform to geological, metallurgical or other expectations and the volume and grade of ore recovered may differ from the estimated levels. It is important to note that Mineral Resources and Mineral Reserves data is not indicative of future production.

Substantial capital expenditure is required to identify and delineate Mineral Resources and Mineral Reserves through geological mapping and drilling, to identify geological features that may prevent or restrict the extraction of ore, to determine the metallurgical processes to extract the metals from the ore and, in the case of new properties, to construct mining and processing facilities.

The MRM department subscribes to a formal risk management process, which endeavours to systematically mitigate all risks relevant to the Mineral Resources and Mineral Reserves. Currently all these risks are at an acceptable level, ie within the set appetite and tolerance levels. It is recognised by Implats that Mineral Resource and Mineral Reserve estimations are based on projections, which may vary as new information becomes available or specifically, if assumptions, modifying factors and market conditions change materially. This approach is consistent with Group definitions of risk as per ISO 31000: 2009: "The effect of uncertainty on objectives". The assumptions, modifying factors and market conditions therefore represent areas of potential risk. In addition, security of Mineral Right tenure or corporate activity could have a material impact on the future mineral asset inventory.

# Auditing and risk

The Group risk management process is described in detail in the 2017 Implats integrated report.

The key steps in risk management are:
- Identifying of objectives (linked to strategy)
- Establishing the context
- Identifying the risk
- Analysing the risk
- Evaluating the risk
- Treating the risk
- Monitoring and reviewing of the risk
- Reporting of the risk.

Arising from this process we identify a set of objective-based risk assessments that cover the key aspects of the Implats business. Each identified risk, as well as its associated controls, has a clearly defined line management owner. This process culminates in the identification of the prioritised strategic risks. The top Group strategic risks are listed below as these directly impact the Mineral Resources and Mineral Reserves (summarised from the 2017 Implats integrated report):
- Sustained depressed PGM basket prices
- Non-delivery of production and productivity targets at Impala Rustenburg
- A significant deterioration in safety performance
- Disruption to operations due to community unrest at Marula
- Policy risk arising from change in legislation in South Africa
- Excessive taxation and levies at Zimbabwean operations
- Failure to progress beneficiation in Zimbabwe
- Unavailability of secure and reliable power at Zimplats
- Capital constraints affecting project delivery/opportunities
- Impact of UG2 support changes.

Similarly, operationally specific risks are listed in each of the sections per individual operation, later in this report.

*SpatialDash™ training session*

# Third-party assurance

**THE MINERAL CORPORATION**
*ADVISORS TO THE MINERAL BUSINESS*

Mr Seef Vermaak
Group Executive: Mineral Resource Management
Impala Platinum Holdings Limited
No 2, Fricker Road, Illovo
Johannesburg
South Africa

08 August 2017

Dear Mr Vermaak

**RE: IMPLATS GROUP AUDIT OF MINERAL RESOURCES AND RESERVES AT 30 JUNE 2017**

The Mineral Corporation has undertaken an audit of the Impala Platinum Holdings Limited (Implats) Mineral Resource and Reserve Statement as at 30 June 2017 (the 2017 Audit). The Mineral Resource and Reserve Statement, which consolidates Mineral Resource and Reserve estimates for the various Implats platinum group metal operations in Zimbabwe and South Africa, was prepared by Implats. The 2017 Audit was completed by Mineral Resource and Reserve Competent Persons from The Mineral Corporation.

During the Collation Phase of the 2017 Audit, a review of Implats' policies and procedures with respect to the estimation, classification and reporting of Mineral Resources and Reserves was undertaken. We then undertook detailed process audits to assess adherence to these policies and procedures, for a selected sub-set of Implats managed operations (14 Shaft at Impala, Clapham Decline at Marula and Bimha at Zimplats), as well as high-level checks of the remaining operations. The Mineral Corporation then reviewed the estimation source files, Life of Mine Plans and consolidated Mineral Resource and Reserve Statements for each operation (business unit level), as well as the Consolidated Statement for Implats. In the Final Report phase, The Mineral Corporation reviewed the Group's Mineral Resource and Reserve Supplement to the Annual Report, 2017.

Implats has demonstrated to The Mineral Corporation's satisfaction that its policies and procedures governing the preparation of Mineral Resource and Reserve estimates, if followed, would result in the reporting of Mineral Resource and Reserve estimates which are compliant with the 2016 Edition of the SAMREC Code, or in the case of Zimplats, the 2012 Edition of the JORC Code.

No technical fatal flaws or material issues were identified in the detailed audits of the operations selected, and hence The Mineral Corporation is of the view that Implats' policies and procedures have been followed. The Mineral Resource estimates satisfy the SAMREC Code and the JORC Code requirement for reasonable (and realistic) prospects for eventual economic extraction. The Mineral Reserve estimates are based on detailed Life of Mine Plans, with their extraction having been demonstrated to be financially viable and justifiable under a set of realistically assumed production levels, Modifying Factors and economic inputs. There were no material issues identified in the estimation source tables and Consolidated Statements for each operation and for the Group in relation to summation, rounding off and presentation of the estimates.

The Mineral Corporation is satisfied that the Mineral Resource and Reserves Supplement to the Implats Annual Report reflects the Mineral Resource and Reserve estimates compiled, and that it in itself, is compliant with respect to the SAMREC Code.

This opinion does not imply that The Mineral Corporation has accepted the role of Competent Person for the purpose of the Mineral Resource and Reserves estimation and sign-off for Implats. Such role resides with the nominated personnel of Implats.

Yours sincerely

**STEWART NUPEN**
***Director***
BSc (Hons), GDE, Pr.Sci.Nat (400174/07), FGSSA, MBA

**CONIACE MADAMOMBE**
***Director***
MSc, BSc (Hons), (Pr.Sci.Nat (400093/08), MGSSA, MBA

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# Mineral rights status

The Mineral and Petroleum Resources Development Act, No 28 of 2002 (MPRDA), governing mineral legislation in South Africa, came into effect on 1 May 2004. The MPRDA, with its associated broad-based socio-economic empowerment charter for the mining industry and its attendant scorecard, as revised and amended from time to time, has played a significant role in the transformation of the South African mining industry. The Act effectively transferred ownership of privately held mineral rights to the state to enable any third party to apply to the Department of Mineral Resources (DMR) for new-order prospecting rights or mining rights over these previously privately held mineral rights. Implats continues to embrace the principles of transformation as a moral and strategic imperative to reinforce its position as a leading southern African mining company, making the best possible use of available Mineral Resources.

A new Mining Charter 2017 was gazetted and implemented on 15 June 2017. This new Mining Charter 2017 contains exacerbated compliance terms and conditions that are substantially different from the 2016 draft Mining Charter. The Chamber of Mines has applied to the High Court of Gauteng for an urgent interdict to suspend the implementation of the new Mining Charter 2017, pending the outcome of a review application to set aside the new Mining Charter 2017.

Regular compliance audits are conducted by the DMR in respect of the Implats Group's mining and prospecting rights. Implats seeks to comply with or exceed all elements of the Mining Charter 2010. We leverage each element of the Mining Charter 2010 in terms of our business performance and therefore increase our value creation potential. In March 2017, Implats submitted its annual Mining Charter reports to the DMR for the 2016 calendar year. According to our submissions all three South African mining operations within the Implats Group comply or exceed the 26% BEE ownership requirement.

The DMR's online application and reporting system, SAMRAD, continues to face system functionality challenges. However, DMR accepts manual applications where SAMRAD fails to accept online applications. To mitigate the risk of third-party applications being accepted by the DMR regional offices, Implats continues to monitor the various regional DMR notice boards for possible acceptance of third-party applications that are in conflict with Implats' rights or pending applications. During this financial year, two conflicting prospecting right applications were identified on respectively a portion of the Impala converted mining right area for chromium and on a portion of the Inkosi Great prospecting right area for chromium. Both Impala and Inkosi have lodged the required appeals in terms of the MPRDA against these applications to prevent third-party conflicting rights being granted.

The DMR has started to implement the findings of the Mawetse Supreme Court of Appeal judgment which concurred with the High Court that a renewal period commences on the date the party has received notice of renewal, notwithstanding the date of execution of the relevant renewal. The DMR has therefore progressed a large amount of renewal applications for which they have received powers of attorney of approval and have notified the applicants. During the 2017 financial year, two prospecting right renewals relating to the Impala/Royal Bafokeng Resources Platinum (Pty) Limited Unincorporated Joint Venture (JV) have been executed. Furthermore, the Wolvekraal/Kareepoort prospecting right relating to Afplats and the Inkosi Gap prospecting right were also renewed. There is currently only two prospecting right renewals outstanding within the Implats Group.

Notwithstanding the finalisation of prospecting right renewal applications, exploration activities continue as the renewal applications were submitted within the required legislative timeframe. The approval of the Diepkuil prospecting right application, which was submitted during the 2016 financial year to secure this JV area (pending the Section 102 and Section 11 approvals to include this JV area into the adjacent Impala converted mining right area), is awaited. The processing of a new prospecting right application in the Mpumalanga province that was accepted by DMR during 2012 is still pending. The Section 102 and Section 11 applications as submitted in June 2013 relating to the JV prospecting rights adjacent to the Impala Rustenburg operation and the Afplats Leeuwkop operation are still being processed by DMR.

# Mineral rights status

Marula has submitted, during the 2017 financial year, a Section 52 notice in terms of the MPRDA in respect of the downscaling of operations and workforce at its Marula operation.

In 2011, Impala reached agreement with Royal Bafokeng Platinum (RBPlat) to access certain of its mining areas at Bafokeng Rasimone Platinum Mine (BRPM) from 6 and 20 Shafts. This is essentially a royalty agreement which will provide mining flexibility to these shafts. The agreement has been amended during the past year to extend the 6 Shaft area. The Mineral Resources and Mineral Reserves involved are not reflected in this report as the ownership has not been transferred.

Fully permitted mining rights are not specified by the SAMREC Code as a prerequisite for the conversion of Mineral Resources to Mineral Reserves. However, Implats is cognisant that a reasonable expectation must exist that such mining rights will be obtained. Implats remains committed to South African legislative requirements to convert applicable prospecting rights to mining rights.

There are still certain sections of the MPRDA Amendment Act, No 49 of 2008 (that was enacted into law on 7 June 2013) that have not come into effect due to critical concerns raised by the mining industry. One concern was the amendment of Section 102 that did not allow for the extension of existing mining or prospecting right areas. However, as this amendment did not come into effect, the mentioned Section 102 applications may continue to be processed. These sections are being revisited by the MPRDA Amendment Act, 2014 (formerly the MPRDA Amendment Bill, B15, 2013). Changes to the MPRDA Amendment Act, 2014 have not been made public since it has been circulated to the National Assembly and the House of Traditional Leaders for approval, and returned to the National Council of Provinces for public hearings.

In Zimbabwe, the previously submitted indigenisation plans for both Zimplats and Mimosa were rejected by the Government. Implats continues to engage with the Zimbabwean Government (GoZ) on an indigenisation implementation plan. At Zimplats the land north of Portal 10 within Zimplats' special mining lease area, SML1, was previously gazetted for compulsory acquisition by the GoZ in 2013. The GoZ re-issued the gazette on 18 November 2016 using the same coordinates as previously gazetted. On 13 January 2017 the GoZ again issued, through a Government Gazette Extraordinary, a preliminary notice in terms of which the Government has given fresh notice that it intends to compulsorily acquire the area north of Portal 10. The new notice has repealed all previous notices issued by the GoZ in respect to its proposed compulsory acquisition of this portion of Zimplats' mining lease area. Zimplats agreed in principle to release the bulk of the area subject to certain conditions and continues to engage the GoZ on the matter.

Depending on the outcome of the matter in the Zimbabwean Administrative Court, or the outcome of any further discussions that Zimplats may have with the GoZ on the matter, the Zimplats Mineral Resources may be significantly reduced.

*Underground drilling, Mimosa*

# Mineral rights status

| South Africa | Mining right (ha) | Prospecting right (ha) | Implats' interest (%) |
|---|---|---|---|
| Impala | 29 773 | – | 96 |
| Impala RBR JV* | – | 3 789 | 49 |
| Afplats | 4 602 | 1 065 | 74 |
| Imbasa | – | 1 673 | 60 |
| Inkosi | – | 2 584 | 49 |
| Marula | 5 494 | 223 | 73 |
| Two Rivers | 10 675 | – | 49 |

| Zimbabwe | Mining leases (ha) | Implats' interest (%) |
|---|---|---|
| Zimplats** | 48 535 | 87 |
| Mimosa | 6 594 | 50 |

** Prospecting joint venture with Royal Bafokeng Resources.*
*** The area could be reduced significantly if Zimplats releases the ground north of Portal 10 to the GoZ. The affected area amounts to 24 954ha if the actual coordinates and chromium claims are accounted for.*

In 2011, Impala reached agreement with **Royal Bafokeng Platinum (RBPlat)** to access certain of its mining areas at **Bafokeng Rasimone Platinum Mine (BRPM)** from **6 and 20 Shafts**.

This is essentially a royalty agreement which will provide mining flexibility to these shafts. The agreement has been amended during the past year to extend the 6 Shaft area. The Mineral Resources and Mineral Reserves involved are not reflected in this report as the ownership has not been transferred.

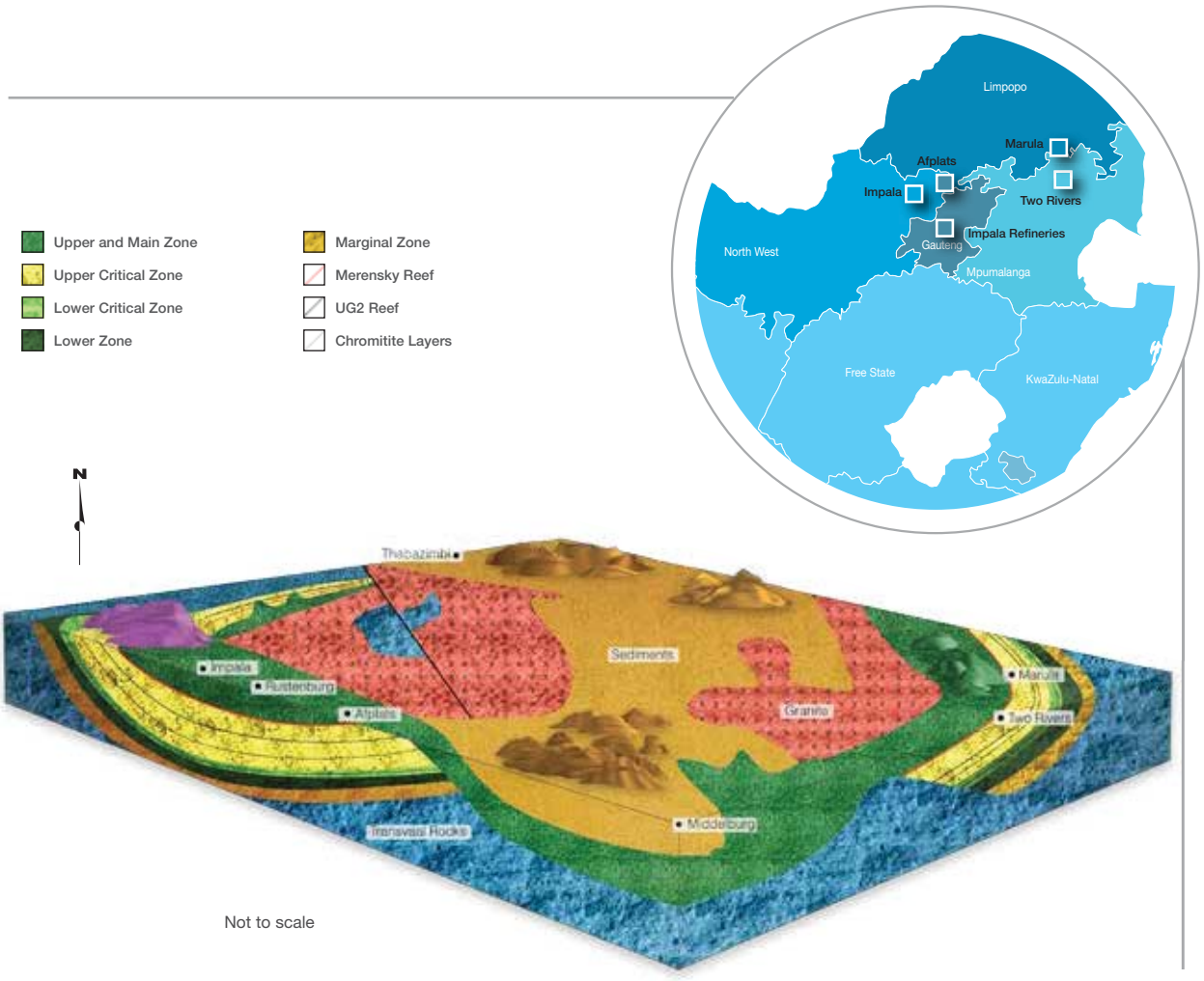
# Regional geological settings

PGMs are a relatively rare commodity – only around 500 tonnes (excluding recycling) are produced annually, of which less than 230 tonnes are platinum – yet they play a progressively more important role in everyday life, such as in autocatalysts to control vehicle emissions, in the production of LCD glass and as hardeners in dental alloy. PGMs – primarily platinum, and the associated by-products, palladium, rhodium, ruthenium, iridium and gold usually occur in association with nickel and copper.

Implats exploits platiniferous horizons within the Bushveld Complex (BC) in South Africa and the Great Dyke in Zimbabwe. These two layered intrusions are unique in terms of size and geological continuity. Mining mostly takes place as underground operations focusing on relatively narrow mineralised horizons, with specific mining methods adapted to suit the local geology and morphology of the mineralised horizons.

## The Bushveld Complex

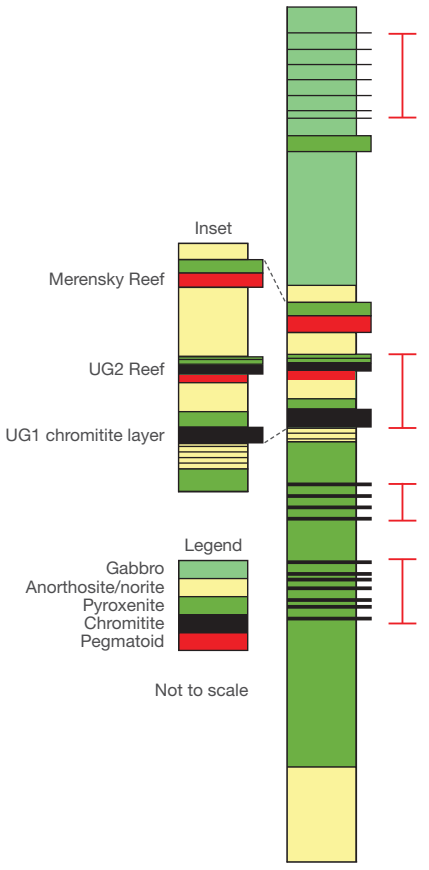
The Bushveld Complex is an extremely large (65 000km$^2$), two billion-year-old layered igneous intrusion occurring in the northern part of South Africa. Rock types range in composition from ultramafic to felsic. The complex is not only unique in size, but also in the range and economic significance of its contained mineral wealth. In addition to the PGMs and associated base metals, vast quantities of chromium, vanadium, tin, fluorine and dimension stone are also produced.



# Regional geological settings

The accompanying map (page 21) and schematic diagram (page 19) show the extent of the Bushveld Complex. The layered sequence, the Rustenburg Layered Suite, comprises five major sub-divisions. These are, from the bottom upwards, the marginal, lower, critical, main and upper zones as indicated in the generalised stratigraphic column below. Two horizons within the critical zone, namely the Merensky Reef and the Upper Group 2 (UG2) Reef, host extensive economically exploitable quantities of PGMs. These two horizons, along with other layers, which can be traced for hundreds of kilometres around the complex, are the focus of Implats' operations. The PGMs – platinum, palladium, rhodium, ruthenium and iridium – as well as the associated gold, copper, nickel, cobalt, chromium and other minor metals and compounds, are mined concurrently, but recovered by different processes. Chromitite layers present below the UG2 Reef contain little to no PGM mineralisation and are mined by other operators for their chromium content.

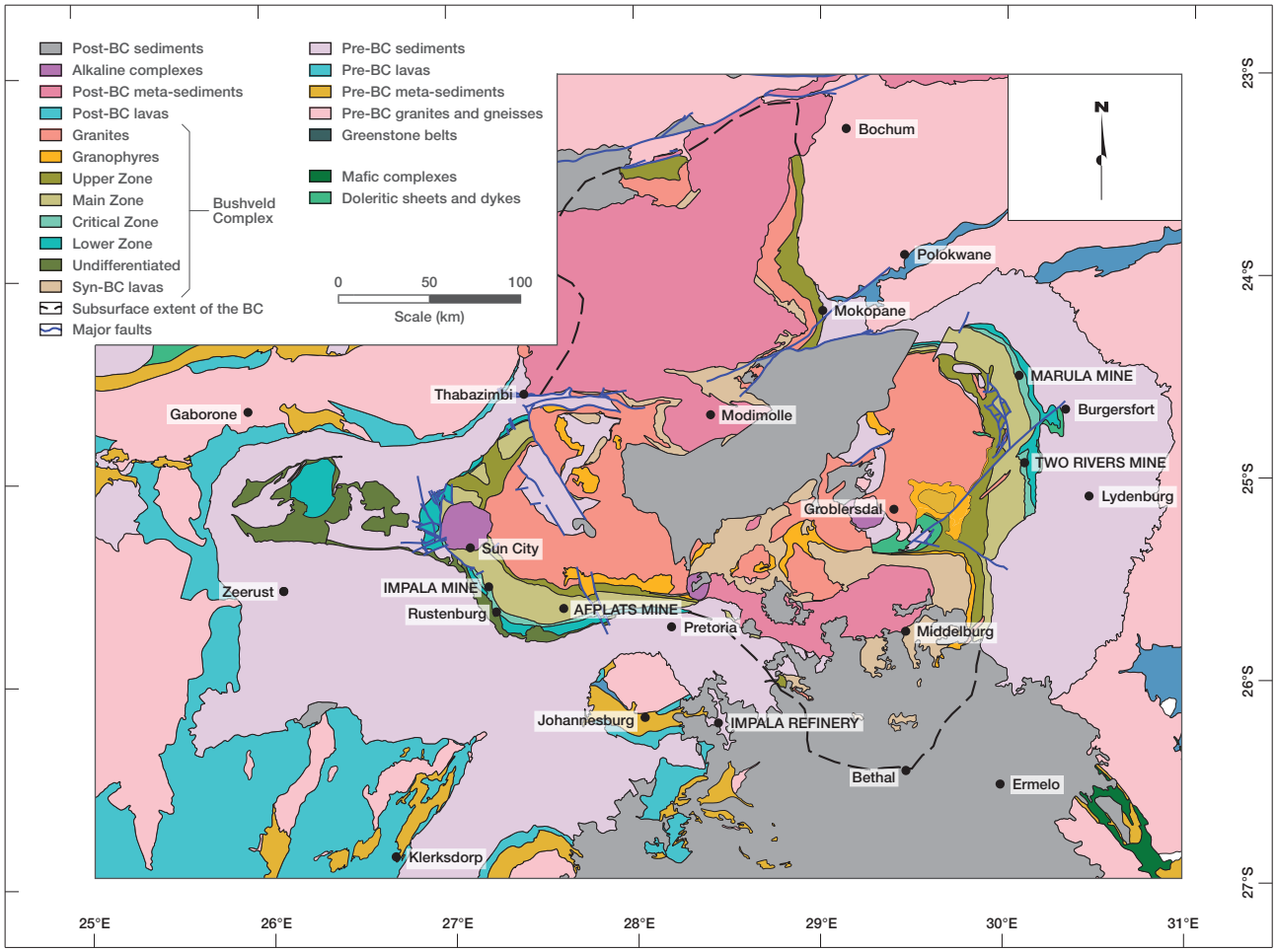
Implats' operations on the Bushveld Complex comprise Impala Mine north of Rustenburg, Marula Mine north-west of Burgersfort and the Two Rivers Mine, a joint venture between Implats and African Rainbow Minerals Limited (ARM) situated south-west of Steelpoort.



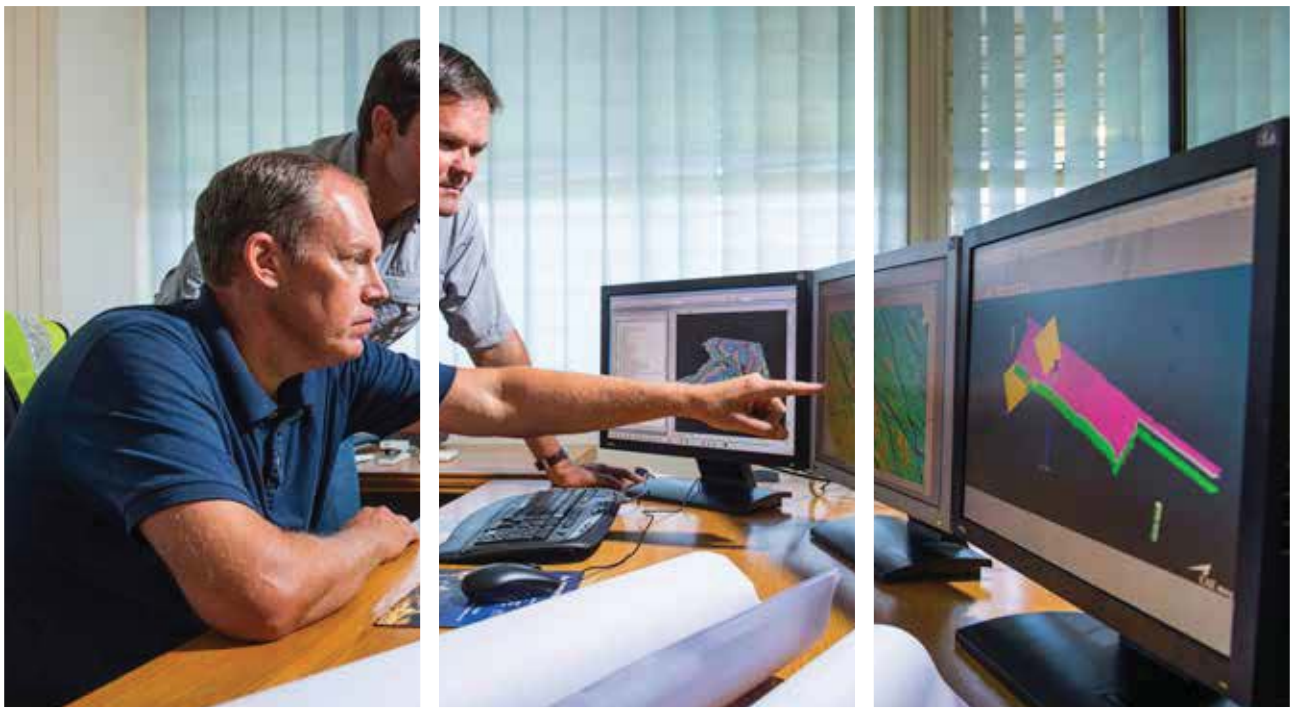

| | Sub-division | Main rock type |
|---|---|---|
| Magnetite layers | UPPER ZONE | Anorthosite<br>Gabbro<br>Olivine diorite<br>Magnetite |
| Pyroxenite marker | MAIN ZONE | Anorthosite<br>Gabbro<br>Norite<br>Pyroxenite |
| Merensky Reef | | |
| Upper group chromitites | UPPER CRITICAL ZONE | Anorthosite<br>Norite<br>Pyroxenite<br>Chromitite |
| Middle group chromitites | | |
| Lower group chromitites | LOWER CRITICAL ZONE | Pyroxenite<br>Chromitite<br>Harzburgite<br>Dunite |
| | LOWER ZONE | Pyroxenite<br>Harzburgite<br>Dunite |
| | MARGINAL ZONE | Norite |

GENERALISED STRATIGRAPHIC COLUMN OF THE BUSHVELD COMPLEX

# Regional geological settings

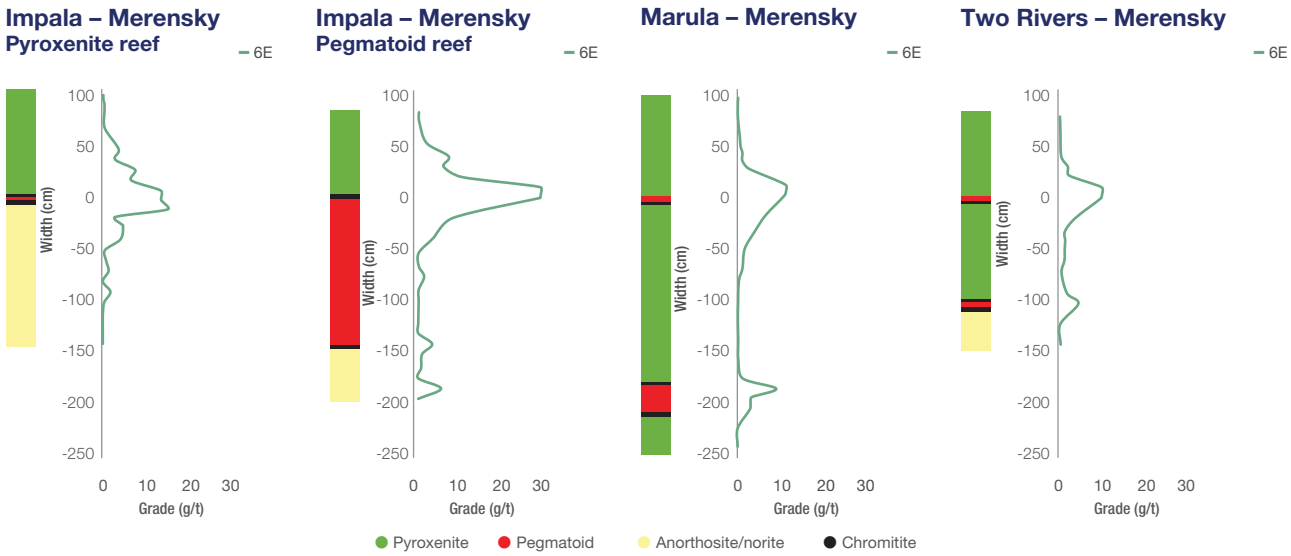



*Simplified map of the Bushveld Complex and surrounding rocks*

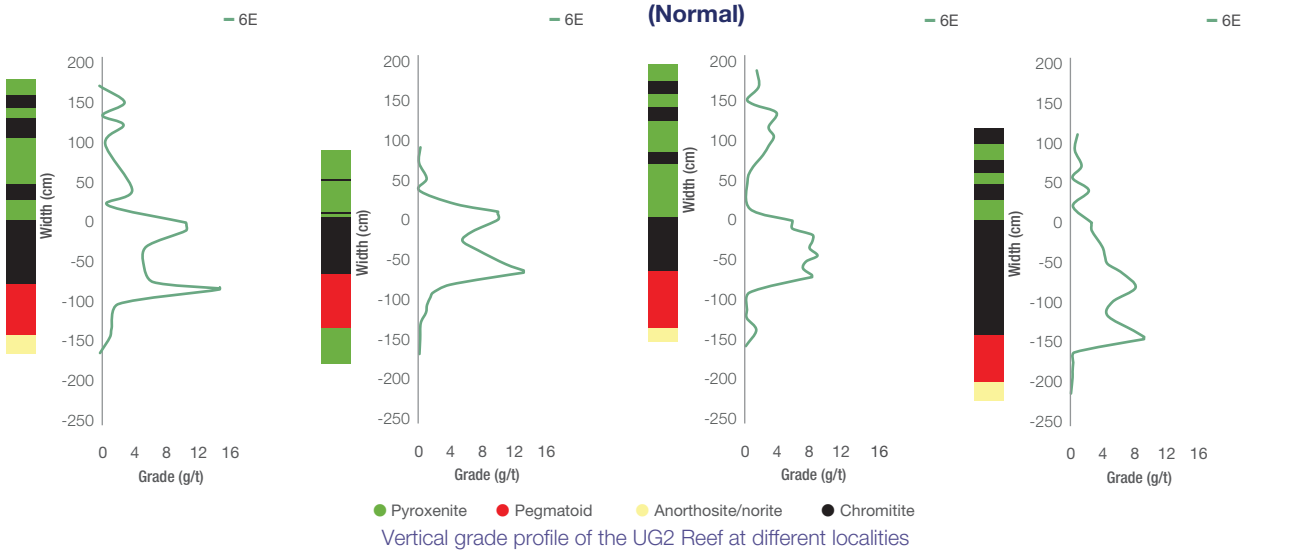


*3D geological modelling*

# Regional geological settings




Vertical grade profile of the Merensky Reef at different localities




Vertical grade profile of the UG2 Reef at different localities

A detailed geological description of the various reef types is provided in the relevant operational sections. Examples of different Merensky Reef vertical grade profiles are shown above. It is clear that the grade distribution varies materially from area to area. The UG2 Reef morphology and associated vertical grade distribution also differs significantly between regions (see above), specifically in terms of the width of the main platinum bearing chromitite layer and in the number of layers. In general the grade increases if the chromitite layer width becomes thinner.

# Regional geological settings

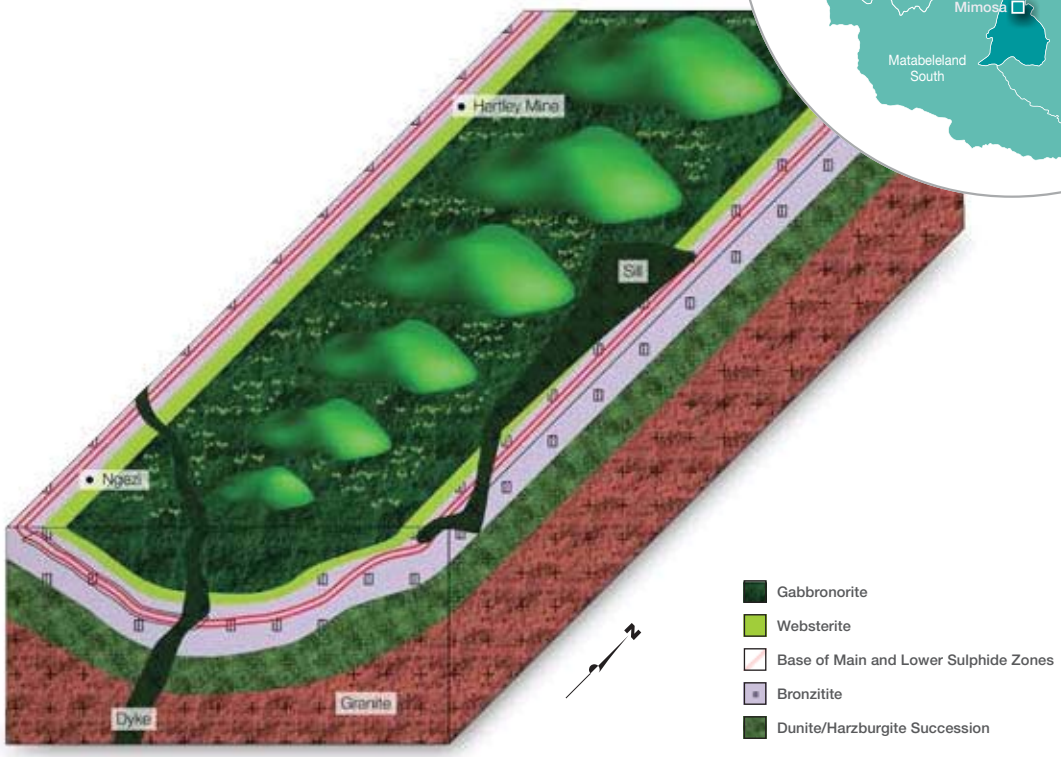
## The Great Dyke

The Great Dyke is a 2.5 billion-year-old layered mafic-ultramafic body intruded into Archaean granites and greenstone belts. It is highly elongated, slightly sinuous, 550km long, north-northeast trending with a maximum width of 12km. It bisects Zimbabwe in a north-northeasterly trend and is divided vertically into a lower ultramafic sequence, comprising cyclic repetitions of pyroxenite, harzburgite, dunite and chromitite, and an upper mafic sequence consisting mainly of norite, gabbronorite and olivine gabbro. The accompanying schematic diagram and map show the extent of the Great Dyke. It is U-shaped in section with layers dipping and flattening towards the axis of the intrusion. Much of the mafic sequence has been removed by erosion and at the present plane of erosion the Dyke is exposed as a series of narrow, contiguous layered complexes or chambers. These are, from north to south, Musengezi, Hartley (comprising the Darwendele and Sebakwe sub-chambers) and a southern chamber comprising the Selukwe and Wedza sub-chambers.

The Main Sulphide Zone (MSZ), host to economically exploitable PGMs and associated base metal mineralisation, is located 10m to 50m below the ultramafic/mafic contact in the P1 pyroxenite. The PGMs, along with gold, copper and nickel, occur in the MSZ. A detailed description of the MSZ and the value distributions is provided in the relevant operations sections. Examples comparing different areas indicate that the grade profiles vary between areas and that the platinum and palladium peaks are somewhat offset. Typically, the MSZ consists of a 2m to 10m-thick zone containing 2% to 8% of iron-nickel-copper sulphides disseminated in pyroxenite. The base of this nickel-copper-rich layer is straddled by a 1m to 5m-thick zone of elevated precious metals (Pt, Pd, Rh and Au). The base metal zone contains up to 5% sulphides, while the sulphide content of the PGM zone is less than 0.5%. This change in sulphide content is related to the metal distribution in a consistent manner and is used as a mining marker. It can normally be located visually in borehole core and with careful observation it can also be located underground, therefore careful monitoring supported by channel sampling and XRF scanning is required to guide mining.

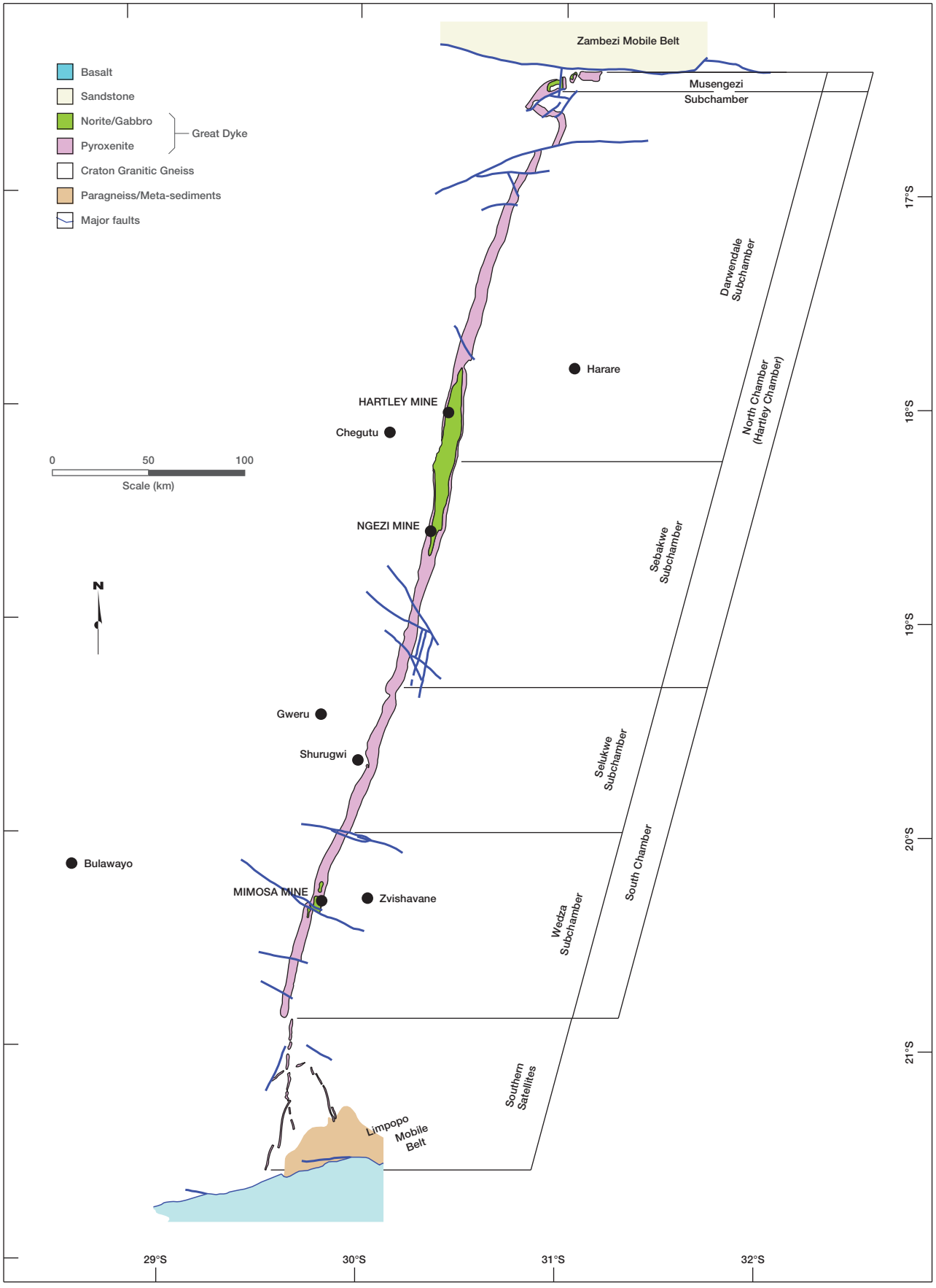
Chromitite layers present below the MSZ contain little to no PGM mineralisation and are mined by other operators for their chromium content only.

Implats' Operations on the Great Dyke comprise Zimplats' Ngezi Mine south-west of Harare and the Mimosa Mine, a joint venture between Implats and Sibanye-Stillwater situated east of Bulawayo.

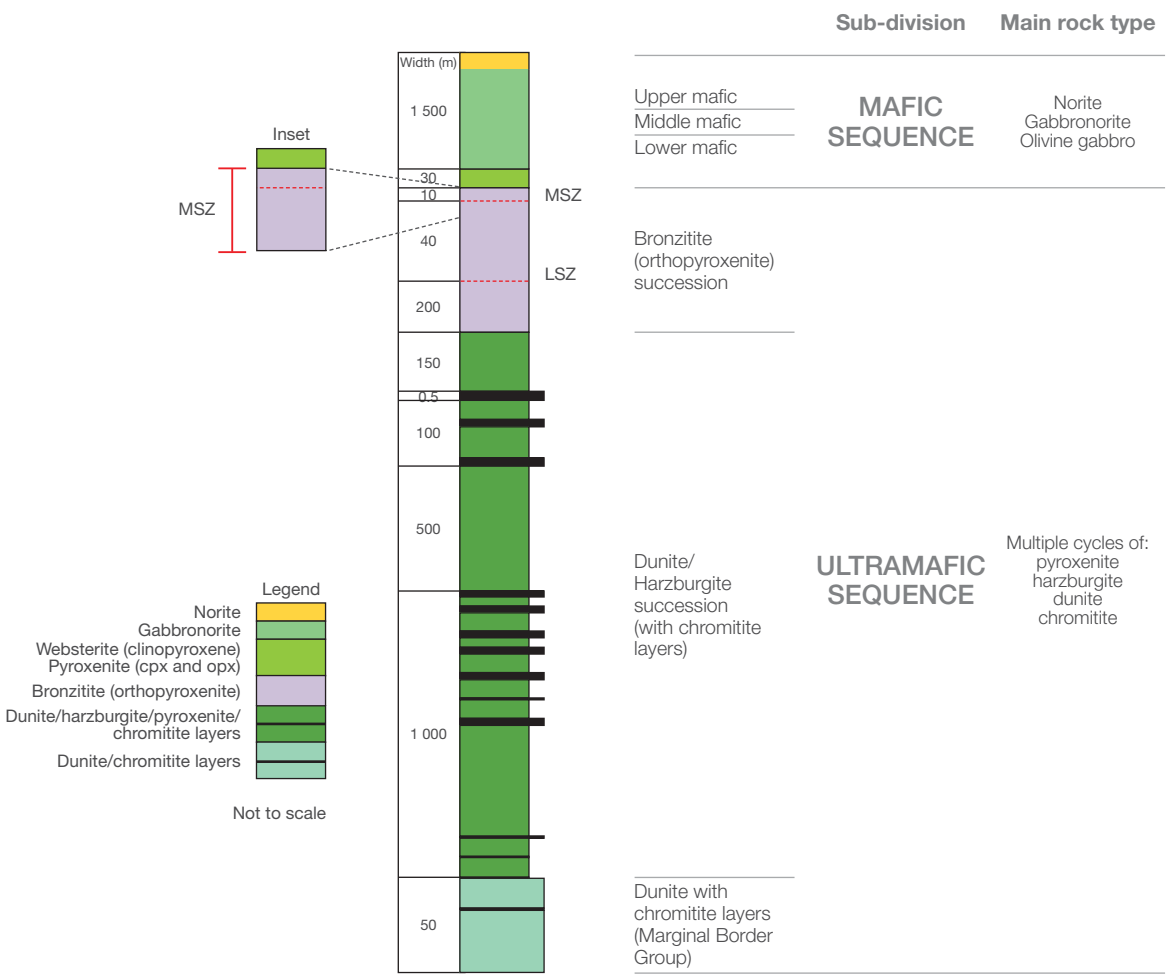




Not to scale

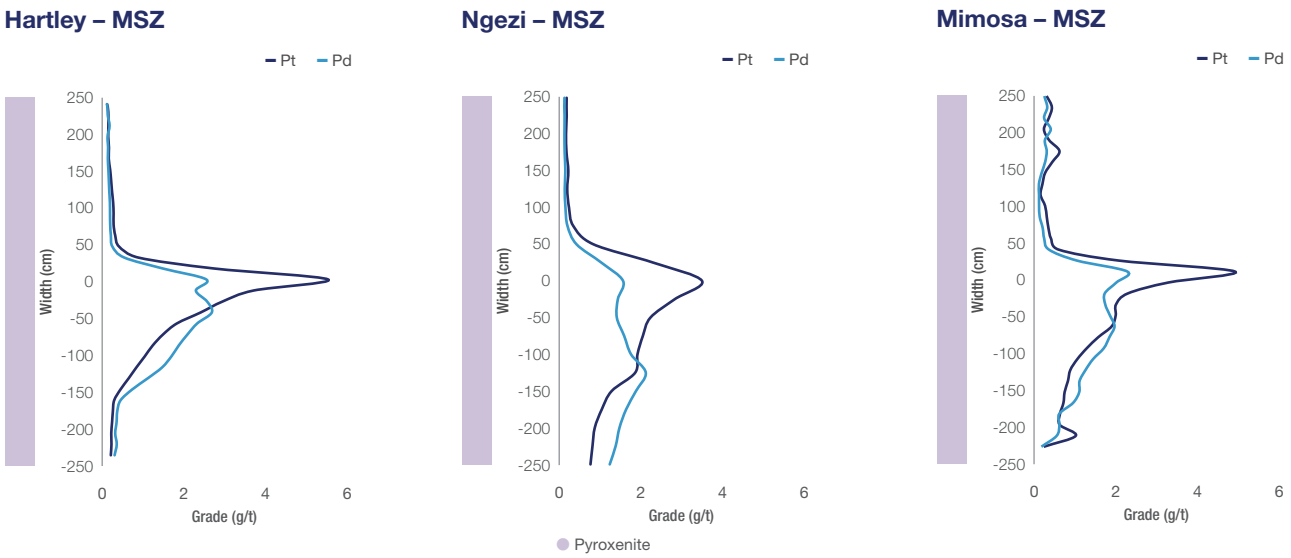
# Regional geological settings



# Regional geological settings




GENERALISED STRATIGRAPHIC COLUMN OF THE GREAT DYKE




Vertical grade profile of the Main Sulphide Zone at different localities

# Exploration review

Given the constrained economic situation of the past few years in the platinum industry, Implats' exploration focus is being limited to current operations. The Group exploration strategy therefore remains unchanged insofar as the main focus is brownfields activities in support of ongoing mining at existing operations. In general, surface borehole spacing during feasibility studies are 500 metres or greater apart, and infill drilling is required on an ongoing basis to better define geological structures, specific local complexities, ground conditions and grade variations to inform mine planning and direct medium-term layouts. The target remains to gather information to direct the five-year Mineral Reserve development plans. As such, brownfields exploration plans are annually revisited and subjected to scrutiny at various management levels to ensure that the Group's imperative of cash conservation is honoured, but at the same time to support optimal mine layouts.

Annual Group exploration expenditure from surface as well as underground operations for the past year amounted to some R123 million. It is projected that 2018 will see a modest increase in levels of expenses to some R132 million.

| | Surface drilling | | | Underground drilling | | | Geotechnical drilling | | |
|---|---|---|---|---|---|---|---|---|---|
| | Total (n) | Length (m) | Amount (R'000) | Total (n) | Length (m) | Amount (R'000) | Total (n) | Length (m) | Amount (R'000) |
| Impala | 8 | 15 870 | 21 431 | 853 | 46 512 | 59 380 | – | – | – |
| Marula | – | – | – | 41 | 4 887 | 3 320 | – | – | – |
| Two Rivers | 4 | 2 493 | 6 610 | 151 | 11 463 | 5 330 | – | – | – |
| Zimplats* | 81 | 15 333 | 17 422 | 75 | 7 433 | 6 939 | 8 | 1 024 | 1 164 |
| Mimosa* | – | – | – | 30 | 3 416 | 2 097 | – | – | – |
| Afplats | – | – | – | – | – | – | – | – | – |
| **Total** | **93** | **33 696** | **45 463** | **1 150** | **73 711** | **77 066** | **8** | **1 024** | **1 164** |

** R13.06 per US dollar (as at 30 June 2017).*

## Bushveld Complex in South Africa

Exploration on the Impala mining area focused on infill drilling from surface at 11, 14, 16 and 20 Shafts where eight boreholes were completed. At the various mining operations at Impala, 853 boreholes were drilled underground, mainly to keep the footwall drives at the ideal elevation.

Due to restricted access, two planned boreholes at the Driekop Shaft of Marula could not be drilled. At the two mining shafts of Marula, 41 boreholes were drilled underground, mainly for water cover, as well as geological delineation.

Exploration drilling on the farm Buffelshoek of Two Rivers commenced and four boreholes were completed. At the two mining shafts of Two Rivers, 151 boreholes were drilled underground, mainly for water cover, as well as geological delineation.

No drilling was done at the Afplats and Imbasa/Inkosi projects.

## Great Dyke in Zimbabwe

At Zimplats, exploration drilling during the year focused on increasing the density of geological and geotechnical data. Surface exploration drilling for Mineral Resources evaluation and geotechnical assessment was done at Rukodzi Mine (two boreholes in the northern area), Mupfuti Mine (11 boreholes), Bimha Mine (10 boreholes), Mupani Mine (four boreholes), Portal 8 (nine boreholes), as well as five twinned boreholes at Hartley. No major unknown geological structures were revealed by the exploration drilling. Underground drilling was done for reef profiling and geotechnical assessment at Ngwarati Mine (nine boreholes), Rukodzi Mine (15 boreholes), Mupfuti Mine (23 boreholes), Bimha Mine (26 boreholes), and Mupani Mine (two boreholes for geotechnical assessment).

No exploration drilling from surface was done at Mimosa during the current reporting period. At the mining operation of Mimosa, 30 boreholes were drilled underground, ahead of advancing mining faces to investigate faults, water and unpay zones.

## Offshore projects

Given that Implats' exploration strategy has been adapted in recent years to focus exploration at the mining operations, the decision was made to test the market for a potential suitor for Implats' interest in the remaining project in Canada (Sunday Lake). North American Palladium was found to be best suited as the project is in their backyard. Implats concluded an option agreement in June 2017 with North American Palladium regarding the Sunday Lake Project in Ontario, Canada. The agreement provides a mechanism whereby North American Palladium could earn the entire 75% interest that Implats holds in the project.

Implats continues to monitor PGM exploration worldwide to maintain intelligence concerning resource developments and exploration opportunities.

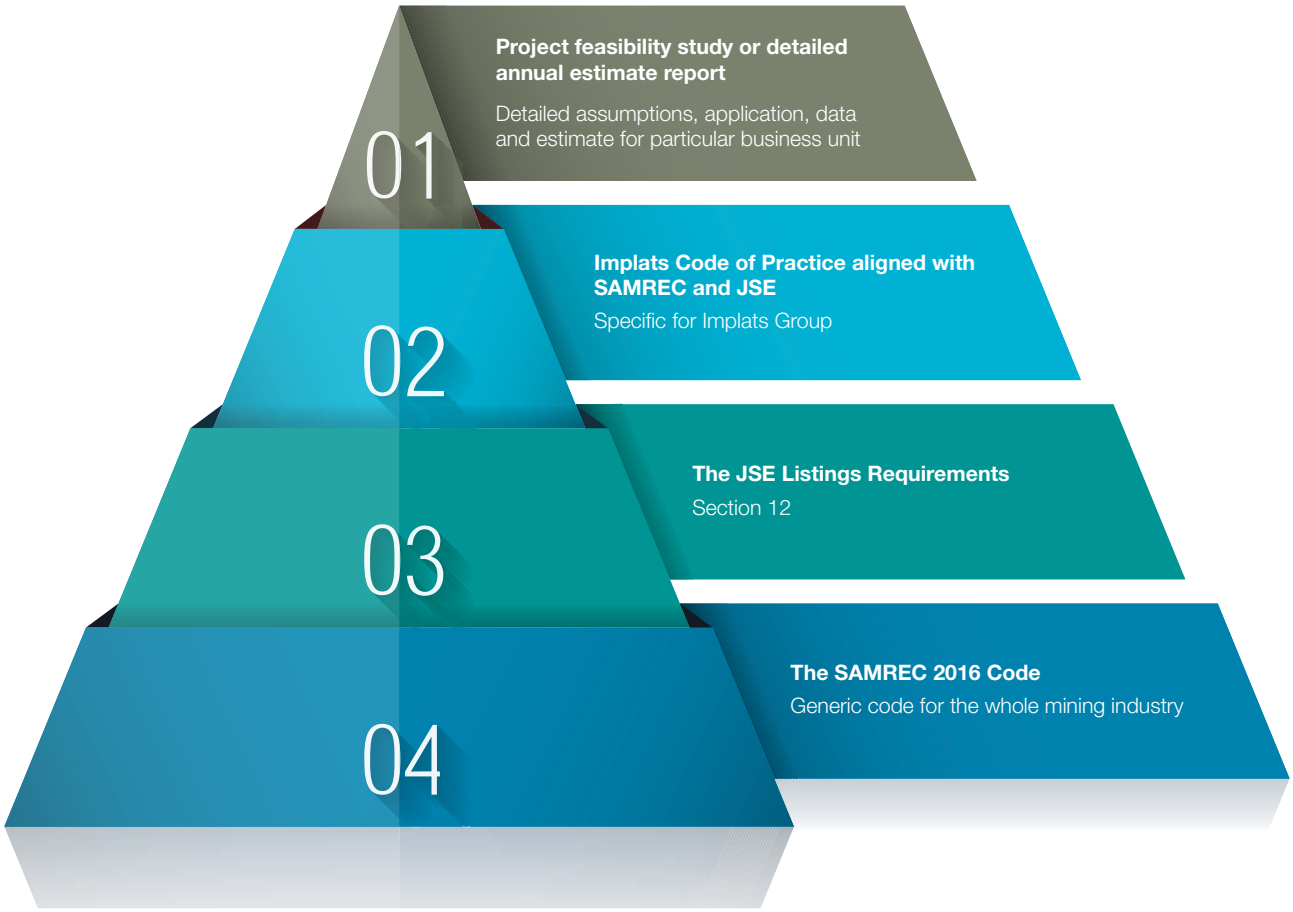
# Relevant assessment and reporting criteria

The following key assumptions and parameters, unless otherwise stated, were used in the compilation of the estimates in this declaration:

- A Group-wide committee, the Implats Resource and Reserve Committee (IRRC), was constituted in 2009 with the objective of promoting standardisation, compliant and transparent reporting, continuous improvement and internal peer reviews. The committee meets quarterly with representatives from the various operations and MRM disciplines. As a result, Implats developed a Group-wide protocol for the estimation, classification and reporting of Mineral Resources and Mineral Reserves in 2010 to enhance standardisation and to facilitate consistency in auditing. This protocol is updated annually with the aim of improving and specifically guiding the classification of Mineral Resources and to ensure compliance with the SAMREC Code (and JORC for Zimplats).

While Zimplats complies to the JORC Code, the definitions are either identical or do not vary materially from the SAMREC Code. This report is compiled in compliance to the guidelines and principles of the SAMREC Code and the JSE Listings Requirements.

**Structured hierarchy of principles, requirements, standards, assumptions and estimates**



# Relevant assessment and reporting criteria

- The work processes and flow are fully integrated with the planning cycle and a structured approach has been adopted with activities aligned in a continuous sequence. The simplified cycle is illustrated below:


- A key aspect of the Group-wide protocol determines the standards for classification of Mineral Resources. The classification standard is a matrix process and measures both geological and grade continuity between points of observation
- Mineral Resource and Mineral Reserve evaluation is based on a systematic process of collecting and validating geological data as depicted in the Group-wide protocol. Updating of geological and geostatistical models with data from exploration and underground drilling, mapping and sampling forms the basis of the Mineral Resource and Mineral Reserve Statements
- Quality, distribution and quantity of available data and the confidence thereof forms the basis of the Mineral Resource classification
- Geostatistical estimation is done using different geostatistical software packages within the Implats Group. Different interpolation methods and geostatistical parameters are used depending on the orebody and sampling density. Ordinary kriging and inverse distance are the main interpolation methods used within the Implats Group
- Implats introduced a depth cut-off in 2010 whereby mineralisation below a certain depth is excluded from the Mineral Resource estimate. This depth cut-off is applicable to the Bushveld Complex setting and is reviewed annually considering a range of assumptions, specifically the virgin rock temperature (VRT), cooling requirements, available technology, support design and other costs, prices and mining depth limits presently in the platinum industry. It is recognised that the actual depth cut-off could vary from area to area. The depth cut-off of 2 350m was applied during the 2013 Implats Mineral Resource estimates and equated to a VRT of 73°C. A depth cut-off of 2 000m below surface was introduced in 2014. In addition to the depth cut-off areas, various Mineral Resource blocks are considered on a case-by-case basis and this has resulted in areas where the eventual economic extraction is in doubt. These areas are excluded from the summation of total Mineral Resources per area and the attributable Mineral Resources (see page 123).

# Relevant assessment and reporting criteria

- Mineral Resource tonnage and grades are estimated *in situ*. The Mineral Resources for the Merensky Reef are estimated at a minimum mining width, and may therefore include mineralisation below the selected cut-off grade Mineral Resource estimates for the UG2 Reef reflect the minimum mineable width and may include dilution
- Mineral Resource estimates for the Main Sulphide Zone are based on optimal mining widths. Such mining widths are reviewed from time to time given varying economic and operational considerations
- Mineral Resource estimates are reported inclusive of Mineral Reserves, unless otherwise stated
- Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining, except where these pillars will never be extracted, such as legal, boundary and shaft pillars
- Mineral Reserve estimates include allowances for mining dilution and are reported as tonnage and grade delivered to the mill
- Rounding-off of figures in the accompanying summary estimates may result in minor computational discrepancies. Where this occurs it is not deemed significant
- It is important to note that the Mineral Resource Statements, in principle, remain imprecise estimates and cannot be referred to as calculations. All Inferred Mineral Resources should be read as “approximations”
- Exploration samples are mainly assayed for all PGEs and Au, using the nickel sulphide fire assay collection method and determining the elements with an inductively coupled plasma mass spectrometer (ICP-MS). Base metal content is determined by an atomic absorption (AA) spectrometer using partial digestion in order to state metal in sulphide that is amenable to recovery by flotation processes. All these analyses are undertaken by Intertek Genalysis via their preparatory branch in Bapsfontein
- Underground samples are mainly assayed for Pt, Pd, Rh and Au using the lead collection method by the in-house laboratories at the respective mines. A partial digestion at the in-house laboratories is used to determine the base metal content of samples using AA
- All references to tonnage are to the metric unit
- All references to ounces (oz) are troy with the factor used being 31.10348 metric grams per ounce
- The Mineral Resources and Mineral Reserves reported for the individual operations and projects are reflected as the total estimate (100%). The corresponding estimates relating to attributable Mineral Resources and Mineral Reserves are only given as combined summary tabulations
- Mineral Reserves are that portion of the Mineral Resource which technical and economic studies have demonstrated can justify extraction at the time of disclosure. Historically, Implats has only converted

*Measuring drilled underground core at 16 Shaft, Impala*

# Relevant assessment and reporting criteria

Mineral Resources to Mineral Reserves on completion of a full feasibility study for a project with board approval of the full project capital and LoM I for an operating mine (as per SAMREC). The conversion of Mineral Resources to Mineral Reserves for Zimplats has been aligned to the Implats standard since 2014

- No Inferred Mineral Resources have been converted into Mineral Reserves at any of the Implats operations reported. According to the SAMREC Code, Inferred Mineral Resources may be included in mine design, mine planning and economic studies only if a mine plan exists and that the Mineral Reserve Statement admits that Inferred Mineral Resources have been used. SAMREC requires that a comparison of the results with and without the Inferred Mineral Resources must be shown and the rationale behind including it must be explained
- There are only limited changes in the estimation principles and reporting style as at 30 June 2017 relative to the previous report
- The term Ore Reserve is interchangeable with the term Mineral Reserve
- Implats uses a discounted cash flow model that embodies economic, financial and production estimates in the valuation of mineral assets. Forecasts of key inputs are:
  - Relative rates of inflation in South Africa and the United States
  - Rand/dollar exchange rate
  - Metal prices
  - Capital expenditure
  - Operating expenditure
  - Production profile
  - Metal recoveries
- The outputs are net present value, the internal rate of return, annual free cash flow, project payback period and funding requirements. Metal price and exchange rate forecasts are regularly updated by the marketing department of Implats. As at 30 June 2017, a real long-term forecast for revenue per platinum ounce sold of R29 100 was used. Specific real long-term forecasts in today's money include:
  - Platinum US$1 300/oz
  - Palladium US$900/oz
  - Rhodium US$1 100/oz
  - Ruthenium US$55/oz
  - Iridium US$630/oz
  - Gold US$1 100/oz
  - Nickel US$14 000/t
  - Copper US$6 700/t
  - Exchange rate R13.88/US$
- The spot basket price calculated for Implats as at 30 June 2017 was R20 963 and the equivalent real long-term consensus basket price is R25 900 (US$2 000) per ounce
- Rigorous profitability tests are conducted to test the viability of the Mineral Reserves, references to this are listed in the sections per operation and highlight the spot price scenarios. A summary graph showing the price sensitivity of the total Group Mineral Reserves is depicted to the right
- An economic profitability test was conducted at each shaft. At Impala and Marula so-called tail-cutting tests were performed. The process entails the determination of when a shaft is no longer profitable and no longer contributes to fixed overheads. Each shaft's processing, services and other costs are split between their relevant fixed and variable portions. Once a shaft is no longer profitable (or contributing to fixed overheads), it is removed from the LoM I profile (and Mineral Reserves) and the fixed costs apportioned to the shaft are then allocated over to the other shafts that remain.

A Mineral Resource, by definition, is *"a concentration or occurrence of solid material of economic interest in or on the earth's crust in such form, grade, quality and quantity that there are reasonable and realistic prospects for eventual economic extraction"*. The interpretation of such "eventual economics" varies significantly. However, it implies some form of high-level view in terms of either "yard-stick comparisons" or high-level scenario models. On this basis Implats has excluded significant mineralisation (a) initially below 2 350m below surface, (b) then 2 000m below surface, and (c) selected areas based on geology and potential infrastructure (see section "Areas excluded from Mineral Resource estimates". In total some 61Moz Pt has been excluded from current statements on this basis. However, under the present price regime and outlook the bulk of Implats' South African Mineral Resources are marginal at best and require long-term metal prices higher than current estimates.

Work is under way to identify opportunities on a scenario scale to optimise these areas in terms of potential output, production costs and future capital expenses. Notably, the Zimbabwean Mineral Resources are reasonably robust in terms of "eventual economic extraction". Mineral Resources beyond current infrastructure investment will require a real long-term basket price in the order of R29 000 per Pt oz (US$1 956). Similarly the deeper Rustenburg Mineral Resources beyond current infrastructure investment require a real basket price of between R28 000 and R33 000 per Pt oz (US$2 233). This suggests that future investments at Impala will at best be marginal under the price assumptions.

**Implats Mineral Reserves vs real basket price**

# The environment

Our activities associated with the exploration, extraction and processing of Mineral Resources result in the unavoidable disturbance of land, the consumption of resources and the generation of waste and atmospheric and water pollutants. Growing regulatory and social pressure, increasing demands for limited natural resources and the changing costs of energy and water all highlight the business imperative of responsible environmental management, particularly as our underground operations become deeper and consume more energy and water. This involves taking measures to address security of resource supply (for example through efficiency, recycling and fuel-switching) and to actively minimise our impacts on natural resources and on the communities around our operations. These measures have direct benefits in terms of reduced costs and liabilities, enhanced resource security and the improved security of our licence to operate.

Implats has an environmental policy that commits the Company to conducting its exploration, mining, processing and refining operations in an environmentally responsible manner and to ensure the well-being of its stakeholders. The policy also commits to integrating environmental management into all aspects of the business with the aim of achieving world-class environmental performance in a sustainable manner.

Our management of the environmental impacts of our operations and processes involves the following focus areas:

- Ensuring full compliance with regulatory requirements
- Promoting responsible water stewardship by minimising water use and water pollution
- Minimising our negative impacts on air quality
- Responding to climate change risks and opportunities and promoting responsible energy management
- Managing our waste streams
- Promoting responsible land management and biodiversity practices.

All our operations have environmental management systems that are ISO 14001 certified and we are committed to retaining certification. In line with our environmental management system expectations, all operations are required to identify and report on environmental incidents. Systems are in place to investigate and determine the direct and root causes of incidents and to address and close out these incidents.

Further details relating to the materiality of environmental aspects, management processes, performance and commitments are reported in the 2017 Sustainable Development report. Rehabilitation provision is further discussed in the 2017 Implats Annual Financial Statements (refer in particular to notes 1.3.13 and 18). These reports will be published at **www.implats.co.za** in September 2017.

The financial provisions for the rehabilitation can be summarised as follows:

| Name | Current cost estimates R million* | Financial provision R million** |
|---|---|---|
| Impala Rustenburg | 931 | 497 |
| Impala Springs | 245 | 186 |
| Marula | 111 | 44 |
| Afplats | 18 | 8 |
| Zimplats | 627 | 364 |
| **Totals** | **1 932** | **1 099** |

* *The current expected cost to restore the environmental disturbances as estimated by third-party experts for purposes regulatory compliance is R2 282 million for the Group. The amounts in the table above for accounting purposes exclude VAT, P's & G's and contingencies. The Zimplats estimate includes P's & G's and contingencies.*

** *Future value of the current cost estimates discounted to current balance sheet date as provided in the Annual Financial Statements of the Group.*

In compliance with the DMR, the South African liabilities are secured through trust funds, insurance policies and bank guarantees.

*Environmental survey at Impala*

# Attributable Mineral Resources and Mineral Reserves

**Attributable Mineral Resources inclusive of Mineral Reserves**
as at 30 June 2017

| | Orebody | Category | Tonnes Mt | 4E grade g/t | 6E grade g/t | Implats' share-holding % | Moz Pt | Pd | Rh | Au | 4E | 6E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Impala** | Merensky | Measured | 127.0 | 6.30 | 7.09 | 96 | 16.2 | 7.2 | 1.48 | 0.87 | 25.7 | 29.0 |
| | | Indicated | 66.0 | 6.31 | 7.11 | 96 | 8.4 | 3.7 | 0.77 | 0.46 | 13.4 | 15.1 |
| | | Inferred | 20.4 | 6.93 | 7.80 | 96 | 2.9 | 1.3 | 0.26 | 0.15 | 4.5 | 5.1 |
| | UG2 | Measured | 158.4 | 5.48 | 6.57 | 96 | 16.1 | 8.6 | 2.93 | 0.25 | 27.9 | 33.5 |
| | | Indicated | 68.2 | 5.50 | 6.60 | 96 | 7.0 | 3.7 | 1.27 | 0.11 | 12.1 | 14.5 |
| | | Inferred | 20.0 | 5.40 | 6.49 | 96 | 2.0 | 1.1 | 0.36 | 0.03 | 3.5 | 4.2 |
| **Total** | | | **460.0** | **5.89** | **6.85** | | **52.6** | **25.6** | **7.06** | **1.87** | **87.1** | **101.3** |
| **Impala/ RBR JV** | Merensky | Measured | 2.6 | 6.73 | 7.57 | 49 | 0.4 | 0.2 | 0.03 | 0.02 | 0.6 | 0.6 |
| | | Indicated | 2.6 | 7.13 | 8.03 | 49 | 0.4 | 0.2 | 0.03 | 0.02 | 0.6 | 0.7 |
| | | Inferred | 1.8 | 7.71 | 8.68 | 49 | 0.3 | 0.1 | 0.03 | 0.02 | 0.5 | 0.5 |
| | UG2 | Measured | 1.2 | 5.23 | 6.28 | 49 | 0.1 | 0.1 | 0.02 | 0.00 | 0.2 | 0.2 |
| | | Indicated | 1.8 | 6.17 | 7.41 | 49 | 0.2 | 0.1 | 0.04 | 0.00 | 0.3 | 0.4 |
| | | Inferred | 1.4 | 6.74 | 8.08 | 49 | 0.2 | 0.1 | 0.03 | 0.00 | 0.3 | 0.4 |
| | **Total Impala/RBR JV** | | **11.4** | **6.73** | **7.75** | | **1.5** | **0.7** | **0.18** | **0.06** | **2.5** | **2.8** |
| **Total** | | | **471.4** | **5.91** | **6.87** | | **54.1** | **26.3** | **7.24** | **1.93** | **89.6** | **104.1** |
| **Marula** | Merensky | Measured | 25.0 | 4.26 | 4.56 | 73 | 2.0 | 1.1 | 0.10 | 0.26 | 3.4 | 3.7 |
| | | Indicated | 5.6 | 4.20 | 4.50 | 73 | 0.4 | 0.2 | 0.02 | 0.06 | 0.8 | 0.8 |
| | | Inferred | 3.8 | 3.82 | 4.10 | 73 | 0.3 | 0.1 | 0.01 | 0.04 | 0.5 | 0.5 |
| | UG2 | Measured | 37.4 | 6.13 | 7.16 | 73 | 3.3 | 3.3 | 0.69 | 0.09 | 7.4 | 8.6 |
| | | Indicated | 16.3 | 6.21 | 7.25 | 73 | 1.4 | 1.5 | 0.30 | 0.04 | 3.3 | 3.8 |
| | | Inferred | 4.7 | 6.29 | 7.34 | 73 | 0.4 | 0.4 | 0.09 | 0.01 | 0.9 | 1.1 |
| **Total** | | | **92.7** | **5.44** | **6.20** | | **7.8** | **6.7** | **1.21** | **0.49** | **16.2** | **18.5** |
| **Afplats** | UG2 | Measured | 72.8 | 5.19 | 6.47 | 74 | 7.4 | 3.3 | 1.39 | 0.06 | 12.1 | 15.1 |
| | | Indicated | 8.0 | 5.11 | 6.36 | 74 | 0.8 | 0.4 | 0.15 | 0.01 | 1.3 | 1.6 |
| | | Inferred | 41.3 | 5.06 | 6.25 | 74 | 4.1 | 1.8 | 0.77 | 0.03 | 6.7 | 8.3 |
| **Total** | | | **122.2** | **5.14** | **6.39** | | **12.3** | **5.5** | **2.31** | **0.09** | **20.1** | **25.1** |
| **Imbasa** | UG2 | Indicated | 16.9 | 4.59 | 5.74 | 60 | 1.5 | 0.7 | 0.29 | 0.01 | 2.5 | 3.1 |
| | | Inferred | 24.1 | 4.53 | 5.70 | 60 | 2.2 | 1.0 | 0.41 | 0.02 | 3.6 | 4.4 |
| **Inkosi** | UG2 | Indicated | 33.2 | 4.87 | 6.14 | 49 | 3.2 | 1.4 | 0.60 | 0.02 | 5.3 | 6.6 |
| | | Inferred | 18.8 | 4.64 | 5.88 | 49 | 1.7 | 0.8 | 0.33 | 0.01 | 2.9 | 3.6 |
| **Total** | | | **93.1** | **4.69** | **5.90** | | **8.6** | **3.9** | **1.63** | **0.07** | **14.2** | **17.7** |
| **Two Rivers** | Merensky | Indicated | 29.7 | 2.85 | 3.11 | 49 | 1.6 | 0.8 | 0.09 | 0.19 | 2.7 | 3.0 |
| | | Inferred | 48.6 | 3.61 | 3.92 | 49 | 3.3 | 1.8 | 0.19 | 0.38 | 5.6 | 6.1 |
| | UG2 | Measured | 7.0 | 4.44 | 5.43 | 49 | 0.6 | 0.3 | 0.10 | 0.01 | 1.1 | 1.2 |
| | | Indicated | 30.4 | 4.36 | 5.28 | 49 | 2.3 | 1.5 | 0.43 | 0.05 | 4.3 | 5.1 |
| | | Inferred | 39.5 | 4.73 | 5.60 | 49 | 3.2 | 2.2 | 0.59 | 0.07 | 6.0 | 7.1 |
| **Total** | | | **155.2** | **3.93** | **4.53** | | **11.0** | **6.6** | **1.41** | **0.69** | **19.7** | **22.6** |
| **Zimplats** | MSZ | Measured | 146.6 | 3.53 | 3.73 | 87 | 8.2 | 6.5 | 0.72 | 1.23 | 16.6 | 17.6 |
| | | Indicated | 579.1 | 3.51 | 3.71 | 87 | 32.3 | 25.1 | 2.84 | 5.41 | 65.3 | 69.0 |
| | | Inferred | 1 066.9 | 3.25 | 3.52 | 87 | 53.8 | 44.3 | 5.26 | 8.00 | 111.6 | 120.8 |
| **Total** | | | **1 792.6** | **3.36** | **3.60** | | **94.4** | **75.9** | **8.82** | **14.63** | **193.6** | **207.3** |
| **Mimosa** | MSZ | Measured | 31.0 | 3.68 | 3.90 | 50 | 1.8 | 1.4 | 0.17 | 0.29 | 3.7 | 3.9 |
| | | Indicated | 15.4 | 3.58 | 3.80 | 50 | 0.9 | 0.7 | 0.08 | 0.14 | 1.8 | 1.9 |
| | | Inferred | 13.4 | 3.46 | 3.67 | 50 | 0.8 | 0.6 | 0.06 | 0.11 | 1.5 | 1.6 |
| **Total** | | | **59.8** | **3.61** | **3.82** | | **3.4** | **2.7** | **0.30** | **0.54** | **7.0** | **7.4** |
| **Total** | | | **2 787** | **4.02** | **4.49** | | **191.6** | **127.5** | **22.9** | **18.4** | **360.4** | **402.6** |

# Attributable Mineral Resources and Mineral Reserves

Implats reports a summary of total attributable platinum ounces as sourced from all categories of Mineral Resources of the Implats Group of companies and its other strategic interests on a percentage equity interest basis. The tabulation on the previous page reflects estimates for platinum, palladium, rhodium and gold (4E), based on the percentage equity interest. For clarity, both attributable Mineral Resources, inclusive of Mineral Reserves, and attributable Mineral Resources exclusive of Mineral Reserves are shown separately. Note that these are not in addition to each other. These are summary estimates and inaccuracy is derived from rounding of numbers. Where this happens it is not deemed significant.

## Notes

- Mineral Resources are quoted inclusive of Mineral Reserves
- Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining
- In addition to the depth cut-off for the reporting of Mineral Resources as previously reported, various Mineral Resource blocks are considered on a case-by-case basis and this has resulted in areas where the eventual economic extraction is in doubt. These areas are excluded from the summation of total Mineral Resources per area and the attributable Mineral Resources. The areas involved occur at Impala, Marula, Afplats and Two Rivers
- In the 2017 Mineral Resource Statement for Impala and Marula, the UG2 is estimated using a minimum mining width compared to the main UG2 chromitite layer width used before. This resulted in an increase of the UG2 Mineral Resource tonnages, but no material change in the Pt Moz
- Implats has chosen not to publish Merensky Reef Mineral Resource estimates for Afplats, Imbasa and Inkosi as the eventual economic extraction is presently in doubt and under review
- The Zimbabwean Government has been pursuing the greater participation in the mining sector by indigenous Zimbabweans. Implats is continuing to engage with the GoZ with respect to agreeing on plans for the indigenisation of Zimplats and Mimosa. The GoZ gazetted its intention to compulsorily acquire a large tract of ground in the northern portion of the Zimplats lease containing some 54Moz Pt. As at 30 June 2017 Zimplats is seeking to solve the matter amicably. These Mineral Resources are included in the estimates and statements shown in this report.
- 4E refers to the summation of platinum, palladium, rhodium and gold
- 6E refers to the summation of platinum, palladium, rhodium, ruthenium, iridium and gold
- Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

**Summary of attributable Mineral Resources**

| | Attributable Moz Pt | | | | |
|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** |
| Impala | 70.3 | 57.6 | 55.0 | 53.1 | 52.6 |
| RBR JV | 3.5 | 1.5 | 1.5 | 1.4 | 1.5 |
| Marula | 7.5 | 7.4 | 8.1 | 7.9 | 7.8 |
| Afplats | 14.3 | 11.9 | 12.3 | 12.3 | 12.3 |
| Imbasa and Inkosi | 8.5 | 8.5 | 8.6 | 8.6 | 8.6 |
| Two Rivers | 2.9 | 2.9 | 12.4 | 12.3 | 11.0 |
| Tamboti | 23.2 | 23.2 | – | – | – |
| Zimplats* | 95.5 | 95.1 | 94.2 | 94.8 | 94.4 |
| Mimosa | 3.9 | 3.7 | 3.7 | 3.6 | 3.4 |
| **Total** | **229.7** | **211.8** | **195.7** | **194.0** | **191.6** |

** Zimplats' Mineral Resources will reduce by some 54Moz Pt if the GoZ is successful in obtaining the ground north of Portal 10.*

In comparison with the previous annual Mineral Resource Statement there have been changes in the attributable Mineral Resources. The total declared at 30 June 2017 is 1% lower at 192Moz Pt compared with 194Moz Pt in 2016. Various small movements in Mineral Resource estimates are reflected at each operation due to additional work, newly acquired data, depletion and updated estimations.

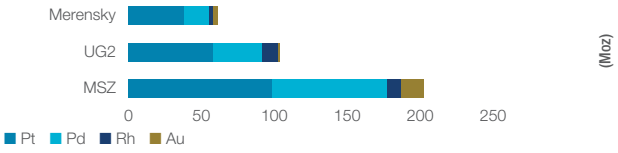
A series of accompanying graphs illustrate the following:

- The total estimated attributable platinum, palladium, rhodium and gold Mineral Resources showing 192Moz Pt, 128Moz Pd, 23Moz Rh and 18Moz Au
- The five-year statistics for the estimated attributable platinum, palladium, rhodium and gold Mineral Resources indicating only small decreases over the past three years
- A breakdown of the different categories on Mineral Resources over the past five years, again reflecting no major variances since the previous reporting period
- The comparison of the estimated attributable 4E Mineral Resources per operation illustrates the relative dominance of Zimplats followed by Impala
- A similar comparison based on platinum ounces shows that the Zimplats Mineral Resources make up the bulk of these (49% of the total Implats inventory)
- The grouping of the platinum ounces per reef shows that some 51% of the attributable Implats Mineral Resources are hosted by the MSZ.

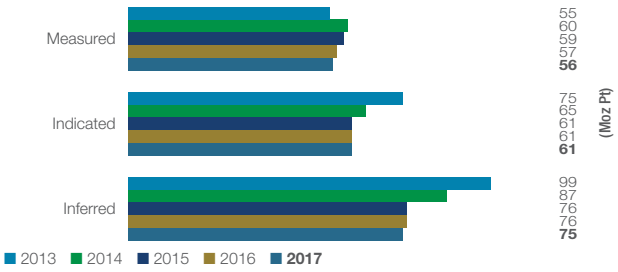
# Attributable Mineral Resources and Mineral Reserves

## Attributable Mineral Resources as at 30 June 2017

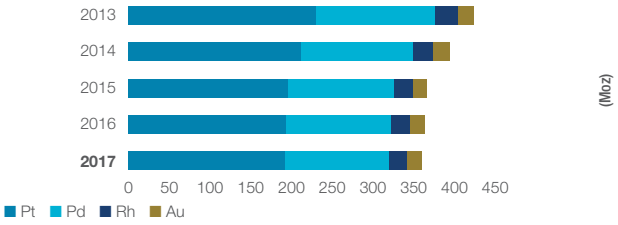

## Attributable Mineral Resources per reef inclusive of Mineral Reserves as at 30 June 2017



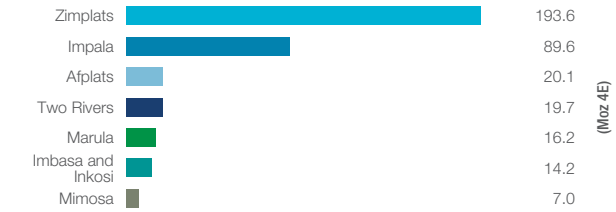

## Attributable Mineral Resources per category



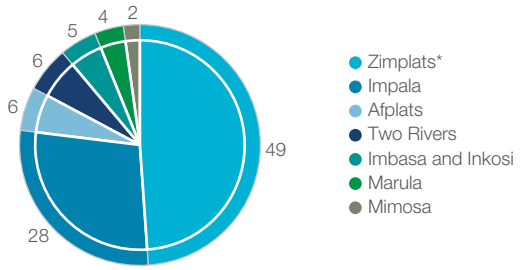

## Attributable Mineral Resources inclusive of Mineral Reserves (4E per annum)



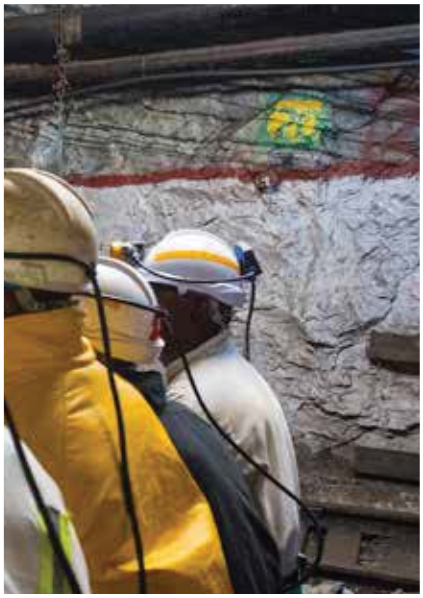

## Implats attributable Mineral Resources (Moz 4E) contribution by area




## Attributable Mineral Resources of 192Moz Pt (%) as at 30 June 2017




** Zimplats' Mineral Resources will reduce by approximately 54Moz Pt if the GoZ is successful in obtaining the ground north of Portal 10.*



*Discussion at an underground waiting place, 11C Shaft, Impala*

# Attributable Mineral Resources and Mineral Reserves

### Attributable Mineral Reserves
as at 30 June 2017

| | Orebody | Category | Tonnes Mt | 4E grade g/t | 6E grade g/t | Implats' share-holding % | Moz Pt | Pd | Rh | Au | 4E | 6E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|
| **Impala** | Merensky | Proved | 10.2 | 3.83 | 4.31 | 96 | 0.8 | 0.3 | 0.07 | 0.04 | 1.3 | 1.4 |
| | | Probable | 62.6 | 4.12 | 4.63 | 96 | 5.2 | 2.3 | 0.48 | 0.28 | 8.3 | 9.3 |
| | UG2 | Proved | 12.8 | 3.74 | 4.49 | 96 | 0.9 | 0.5 | 0.16 | 0.01 | 1.5 | 1.9 |
| | | Probable | 75.6 | 3.67 | 4.40 | 96 | 5.2 | 2.7 | 0.94 | 0.08 | 8.9 | 10.7 |
| | **Total** | | **161.2** | **3.86** | **4.49** | **96** | **12.1** | **5.9** | **1.64** | **0.42** | **20.0** | **23.3** |
| **Marula** | UG2 | Proved | 3.2 | 4.13 | 4.82 | 73 | 0.2 | 0.2 | 0.04 | 0.00 | 0.4 | 0.5 |
| | | Probable | 15.2 | 3.95 | 4.62 | 73 | 0.9 | 0.9 | 0.18 | 0.02 | 1.9 | 2.3 |
| | **Total** | | **18.3** | **3.98** | **4.65** | **73** | **1.0** | **1.1** | **0.22** | **0.03** | **2.4** | **2.7** |
| **Two Rivers** | UG2 | Proved | 5.3 | 2.96 | 3.64 | 49 | 0.3 | 0.2 | 0.05 | 0.01 | 0.5 | 0.6 |
| | | Probable | 11.0 | 2.77 | 3.39 | 49 | 0.5 | 0.3 | 0.10 | 0.01 | 1.0 | 1.2 |
| | **Total** | | **16.3** | **2.83** | **3.47** | **49** | **0.8** | **0.5** | **0.15** | **0.02** | **1.5** | **1.8** |
| **Zimplats** | MSZ | Proved | 55.3 | 3.25 | 3.43 | 87 | 2.9 | 2.3 | 0.24 | 0.42 | 5.8 | 6.1 |
| | | Probable | 88.3 | 3.26 | 3.44 | 87 | 4.6 | 3.6 | 0.38 | 0.67 | 9.3 | 9.8 |
| | **Total** | | **143.7** | **3.25** | **3.43** | **87** | **7.5** | **5.9** | **0.62** | **1.09** | **15.0** | **15.9** |
| **Mimosa** | MSZ | Proved | 13.0 | 3.54 | 3.81 | 50 | 0.7 | 0.6 | 0.06 | 0.12 | 1.5 | 1.6 |
| | | Probable | 5.6 | 3.37 | 3.63 | 50 | 0.3 | 0.2 | 0.03 | 0.05 | 0.6 | 0.7 |
| | **Total** | | **18.7** | **3.49** | **3.76** | **50** | **1.0** | **0.8** | **0.09** | **0.17** | **2.1** | **2.3** |
| **All** | **Total** | | **358.1** | **3.52** | **3.95** | | **22.4** | **14.1** | **2.72** | **1.72** | **41.0** | **45.9** |

### Summary of attributable Mineral Reserves

| | Attributable Moz Pt | | | | |
|---|---|---|---|---|---|
| | **2013** | **2014** | **2015** | **2016** | **2017** |
| Impala | 19.8 | 19.8 | 19.2 | 13.5 | 12.1 |
| Marula | 1.1 | 1.1 | 1.2 | 1.1 | 1.0 |
| Two Rivers | 0.9 | 0.8 | 1.1 | 1.1 | 0.8 |
| Zimplats | 10.8 | 6.2 | 3.9 | 5.1 | 7.5 |
| Mimosa | 0.7 | 0.6 | 1.0 | 0.9 | 1.0 |
| **Total** | **33.3** | **28.4** | **26.4** | **21.6** | **22.4** |

*UG1 outcrop at Two Rivers*

# Attributable Mineral Resources and Mineral Reserves

## Notes

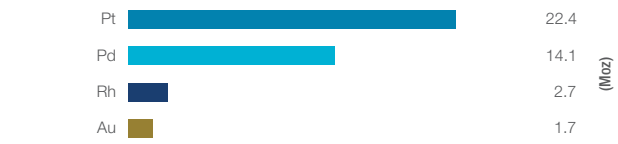
- The modifying factors used to convert a Mineral Resource to a Mineral Reserve are derived from historical performance while taking future anticipated conditions into account
- Mineral Reserves quoted reflect the grade delivered to the mill
- Zimplats' Mineral Reserves increased since 2016 with the conversion of Mineral Resources to Mineral Reserves at the Mupani Mine (Portal 6)
- Mimosa's Mineral Reserves increased since 2016 with the conversion of some Mineral Resources to Mineral Reserves at the Mtshingwe Mine
- The economic valuation and tail-cutting impacted somewhat negatively on the Mineral Reserves at Impala and Marula
- The Mineral Reserves at Impala, Marula and Two Rivers decreased slightly
- 4E refers to the summation of platinum, palladium, rhodium and gold
- 6E refers to the summation of platinum, palladium, rhodium, ruthenium, iridium and gold
- Rounding of numbers may result in minor computational discrepancies. The results tabulated in this report must be read as estimates and not as calculations.

Implats reported attributable Mineral Reserves of some 22.4Moz Pt at 30 June 2017 compared to 21.6Moz Pt in June 2016. The increase can mostly be ascribed to the conversion to Mineral Reserves of the Mupani Mine at Zimplats and the increase in Mineral Reserves at Mimosa's Mtshingwe Mine. This is offset by the decreases at Impala, Marula and Two Rivers.

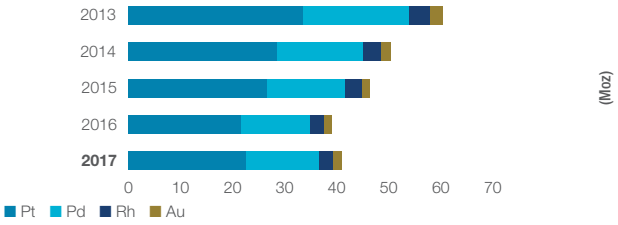
The attendant series of graphs compare the last few reporting periods and indicate an overall increase in attributable Mineral Reserves in line with depletion and the aforementioned changes.

- The total estimated attributable platinum, palladium, rhodium and gold Mineral Reserves showing 22.4Moz Pt, 14.1Moz Pd, 2.7Moz Rh and 1.7Moz Au
- The five-year statistics for the estimated attributable platinum, palladium, rhodium and gold Mineral Reserves indicating an effective overall increase as at 30 June 2017 compared with the previous reporting period
- A breakdown of the different categories on Mineral Reserves over the past five years, again reflects the effective increase in 2017
- The comparison of the estimated attributable 4E Mineral Reserves per operation illustrates the relative dominance of Impala followed by Zimplats
- A similar comparison based on platinum ounces shows that the Impala Mineral Reserves make up the bulk of these (54% of the total Implats inventory)
- The grouping of the platinum ounces per reef shows that some 38% of the attributable Implats Mineral Reserves is hosted by the MSZ, 35% by the UG2 and 27% by the Merensky Reef.

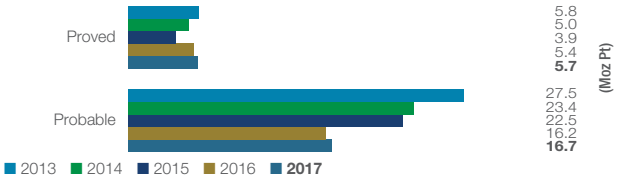
**Attributable Mineral Reserves** as at 30 June 2017



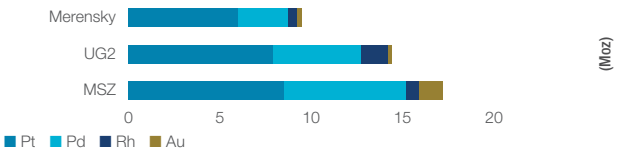

**Attributable Mineral Reserves** (4E per annum)




**Attributable Mineral Reserves** per category

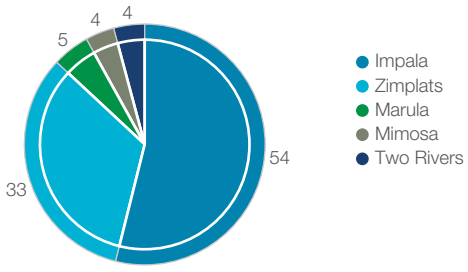



**Attributable Mineral Reserves per reef** as at 30 June 2017




**Implats attributable Mineral Reserves (Moz 4E) contribution by area**


**Attributable Mineral Reserves of 22.4Moz Pt** (%)
as at 30 June 2017



# Mineral Resources summary, exclusive of Mineral Reserves

**Summary of Mineral Resources estimate, exclusive of Mineral Reserves**
as at 30 June 2017

| | Orebody | Remarks | Category | Tonnes Mt | 4E grade g/t | 6E grade g/t | Implats' share-holding % | Pt | Pd | Rh | Au | 4E | 6E |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| | | | | | | | | Moz | | | | | |
| IMPALA | Merensky | | Measured | 61.7 | 6.37 | 7.17 | 96 | 8.0 | 3.5 | 0.73 | 0.43 | 12.6 | 14.2 |
| | | | Indicated | 66.0 | 6.31 | 7.11 | 96 | 8.4 | 3.7 | 0.77 | 0.46 | 13.4 | 15.1 |
| | | | Inferred | 20.4 | 6.93 | 7.80 | 96 | 2.9 | 1.3 | 0.26 | 0.15 | 4.5 | 5.1 |
| | UG2 | | Measured | 74.0 | 5.37 | 6.45 | 96 | 7.4 | 3.9 | 1.34 | 0.11 | 12.8 | 15.3 |
| | | | Indicated | 68.2 | 5.50 | 6.60 | 96 | 7.0 | 3.7 | 1.27 | 0.11 | 12.1 | 14.5 |
| | | | Inferred | 20.0 | 5.40 | 6.49 | 96 | 2.0 | 1.1 | 0.36 | 0.03 | 3.5 | 4.2 |
| | Merensky | Impala/ RBR JV | Measured | 2.6 | 6.73 | 7.57 | 49 | 0.4 | 0.2 | 0.03 | 0.02 | 0.6 | 0.6 |
| | | | Indicated | 2.6 | 7.13 | 8.03 | 49 | 0.4 | 0.2 | 0.03 | 0.02 | 0.6 | 0.7 |
| | | | Inferred | 1.8 | 7.71 | 8.68 | 49 | 0.3 | 0.1 | 0.03 | 0.02 | 0.5 | 0.5 |
| | UG2 | | Measured | 1.2 | 5.23 | 6.28 | 49 | 0.1 | 0.1 | 0.02 | 0.00 | 0.2 | 0.2 |
| | | | Indicated | 1.8 | 6.17 | 7.41 | 49 | 0.2 | 0.1 | 0.04 | 0.00 | 0.3 | 0.4 |
| | | | Inferred | 1.4 | 6.74 | 8.08 | 49 | 0.2 | 0.1 | 0.03 | 0.00 | 0.3 | 0.4 |
| | **Total Impala** | | | **321.6** | **5.96** | **6.92** | | **37.1** | **18.0** | **4.91** | **1.35** | **61.4** | **71.2** |
| MARULA | Merensky | | Measured | 25.0 | 4.26 | 4.56 | 73 | 2.0 | 1.1 | 0.10 | 0.26 | 3.4 | 3.7 |
| | | | Indicated | 5.6 | 4.20 | 4.50 | 73 | 0.4 | 0.2 | 0.02 | 0.06 | 0.8 | 0.8 |
| | | | Inferred | 3.8 | 3.82 | 4.10 | 73 | 0.3 | 0.1 | 0.01 | 0.04 | 0.5 | 0.5 |
| | UG2 | | Measured | 22.2 | 6.23 | 7.27 | 73 | 2.0 | 2.0 | 0.42 | 0.05 | 4.4 | 5.2 |
| | | | Indicated | 16.3 | 6.21 | 7.25 | 73 | 1.4 | 1.5 | 0.30 | 0.04 | 3.3 | 3.8 |
| | | | Inferred | 4.7 | 6.29 | 7.34 | 73 | 0.4 | 0.4 | 0.09 | 0.01 | 0.9 | 1.1 |
| | **Total Marula** | | | **77.6** | **5.33** | **6.04** | | **6.5** | **5.4** | **0.94** | **0.45** | **13.3** | **15.1** |
| AFPLATS, IMBASA AND INKOSI | UG2 | Afplats | Measured | 72.8 | 5.19 | 6.47 | 74 | 7.4 | 3.3 | 1.39 | 0.06 | 12.1 | 15.1 |
| | | | Indicated | 8.0 | 5.11 | 6.36 | 74 | 0.8 | 0.4 | 0.15 | 0.01 | 1.3 | 1.6 |
| | | | Inferred | 41.3 | 5.06 | 6.25 | 74 | 4.1 | 1.8 | 0.77 | 0.03 | 6.7 | 8.3 |
| | | **Total Afplats** | | **122.2** | **5.14** | **6.39** | | **12.3** | **5.5** | **2.31** | **0.09** | **20.2** | **25.1** |
| | | Imbasa | Indicated | 16.9 | 4.59 | 5.74 | 60 | 1.5 | 0.7 | 0.29 | 0.01 | 2.5 | 3.1 |
| | | | Inferred | 24.1 | 4.53 | 5.70 | 60 | 2.2 | 1.0 | 0.41 | 0.02 | 3.5 | 4.4 |
| | | Inkosi | Indicated | 33.2 | 4.87 | 6.14 | 49 | 3.2 | 1.4 | 0.60 | 0.02 | 5.2 | 6.6 |
| | | | Inferred | 18.8 | 4.64 | 5.88 | 49 | 1.7 | 0.8 | 0.33 | 0.01 | 2.8 | 3.6 |
| | | **Total Imbasa/Inkosi** | | **93.1** | **4.70** | **5.92** | | **8.6** | **3.9** | **1.63** | **0.07** | **14.0** | **17.7** |
| TWO RIVERS | Merensky | | Indicated | 29.7 | 2.85 | 3.11 | 49 | 1.6 | 0.8 | 0.09 | 0.19 | 2.7 | 3.0 |
| | | | Inferred | 48.6 | 3.61 | 3.92 | 49 | 3.3 | 1.8 | 0.19 | 0.38 | 5.6 | 6.1 |
| | UG2 | | Measured | 1.7 | 5.03 | 6.10 | 49 | 0.2 | 0.1 | 0.03 | 0.00 | 0.3 | 0.3 |
| | | | Indicated | 18.0 | 4.72 | 5.69 | 49 | 1.5 | 1.0 | 0.28 | 0.03 | 2.7 | 3.3 |
| | | | Inferred | 39.5 | 4.73 | 5.60 | 49 | 3.2 | 2.2 | 0.60 | 0.06 | 6.0 | 7.1 |
| | **Total Two Rivers** | | | **137.5** | **3.93** | **4.49** | | **9.7** | **5.8** | **1.19** | **0.66** | **17.4** | **19.8** |
| ZIMPLATS | MSZ | | Measured | 71.5 | 3.71 | 3.91 | 87 | 4.2 | 3.4 | 0.36 | 0.61 | 8.5 | 9.0 |
| | | | Indicated | 454.3 | 3.54 | 3.74 | 87 | 25.5 | 19.8 | 2.17 | 4.23 | 51.7 | 54.7 |
| | | | Inferred | 1066.9 | 3.25 | 3.52 | 87 | 53.8 | 44.3 | 5.36 | 8.18 | 111.6 | 120.8 |
| | **Total Zimplats** | | | **1592.7** | **3.36** | **3.60** | | **83.5** | **67.5** | **7.89** | **13.01** | **171.9** | **184.4** |
| MIMOSA | MSZ | | Measured | 12.5 | 3.50 | 3.72 | 50 | 0.7 | 0.5 | 0.06 | 0.12 | 1.4 | 1.5 |
| | | | Indicated | 9.0 | 3.66 | 3.89 | 50 | 0.5 | 0.4 | 0.04 | 0.09 | 1.1 | 1.1 |
| | | | Inferred | 13.4 | 3.46 | 3.67 | 50 | 0.8 | 0.6 | 0.06 | 0.12 | 1.5 | 1.6 |
| | **Total Mimosa** | | | **34.9** | **3.53** | **3.74** | | **2.0** | **1.5** | **0.16** | **0.32** | **4.0** | **4.2** |
| | **ALL MINERAL RESOURCES EXCLUSIVE OF MINERAL RESERVES** | | Measured | 345 | 5.03 | 5.82 | | 32 | 18 | 4 | 2 | 56 | 65 |
| | | | Indicated | 730 | 4.15 | 4.65 | | 53 | 34 | 6 | 5 | 98 | 109 |
| | | | Inferred | 1 305 | 3.58 | 3.98 | | 75 | 56 | 9 | 9 | 148 | 164 |
| | | | **Total** | **2 380** | **3.97** | **4.45** | | **160** | **108** | **19** | **16** | **302** | **338** |

# Mineral Resources summary, exclusive of Mineral Reserves

Both inclusive and exclusive methods of reporting Mineral Resources are permitted by various international reporting codes. Implats has adopted the inclusive reporting for consistency purposes and to be aligned with its strategic partners. A collation of the Mineral Resources estimates exclusive of Mineral Reserves is presented on the previous page as it allows for additional transparency. Note that this format is not adhered to by Implats' strategic partners and the corresponding estimates have been derived from details provided to Implats.

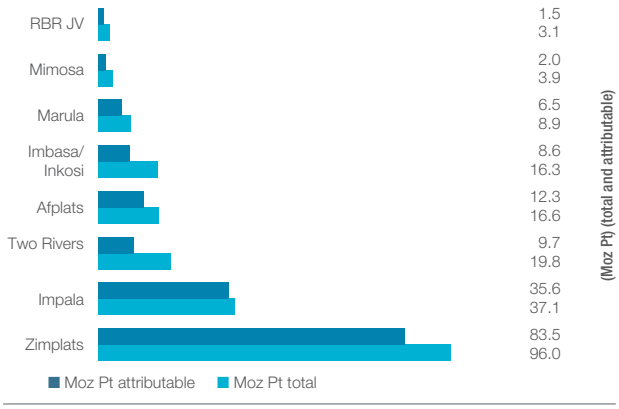
### Summary of attributable Mineral Resources exclusive of Mineral Reserves

| | Attributable Moz Pt | | | | |
|---|---|---|---|---|---|
| | 2013 | 2014 | 2015 | 2016 | 2017 |
| Impala | 40.7 | 28.4 | 27.9 | 34.6 | 35.6 |
| RBR JV | 3.5 | 1.5 | 1.5 | 1.4 | 1.5 |
| Marula | 6.3 | 6.3 | 6.7 | 6.9 | 6.5 |
| Afplats | 14.3 | 11.9 | 12.3 | 12.3 | 12.3 |
| Imbasa/Inkosi | 8.5 | 8.5 | 8.6 | 8.6 | 8.6 |
| Two Rivers | 1.7 | 1.7 | 10.7 | 10.8 | 9.7 |
| Tamboti | 23.2 | 23.2 | – | – | – |
| Zimplats | 81.5 | 87.3 | 89.2 | 87.8 | 83.5 |
| Mimosa | 2.9 | 2.9 | 2.3 | 2.3 | 2.0 |
| **Total** | **182.6** | **171.7** | **159.2** | **164.7** | **159.7** |

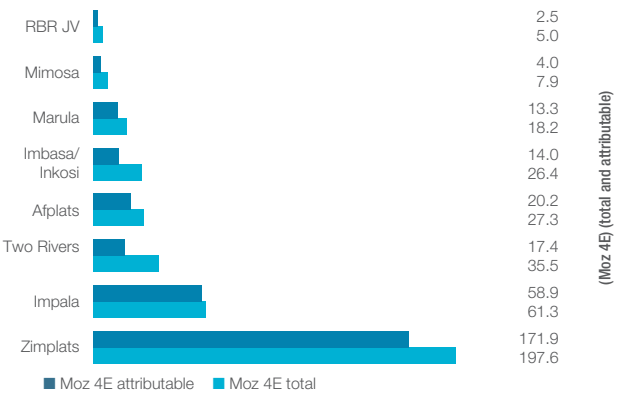
## Notes

- The figures in the accompanying table reflect those Mineral Resources that have not been converted to Mineral Reserves, ie these are the Mineral Resources exclusive of Mineral Reserves
- The tabulation should be read in conjunction with the Mineral Reserve Statements in the preceding sections
- A direct comparison of tonnes and grade is not possible between inclusive and exclusive reporting, owing to the mixing of Mineral Resource figures with production estimates
- Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining
- Note that similar to previous reports, certain areas have been excluded from the Mineral Resource estimates and are now reported in a standalone section at the end of this report
- Implats has chosen not to publish Merensky Reef Mineral Resource estimates for Afplats, Imbasa and Inkosi as the eventual economic extraction is presently in doubt
- At Impala the exclusive Mineral Resources increased, due to the change in reporting of the UG2 Mineral Resources from a channel width to a minimum mineable width
- At Marula the Inferred Mineral Resources of the Hackney farm portion were excluded from the Mineral Resources, but due to the change in reporting of the UG2 Mineral Resources from a channel width to a minimum mineable width, the impact on the exclusive Mineral Resources was only a slight decrease
- The decrease in the Exclusive Mineral Resources of Two Rivers is attributed by the updated models which resulted in a change in Mineral Resource width
- Zimplats' exclusive Mineral Resources decreased since 2016 with the conversion of the Mupani Mine (Portal 6) to Mineral Reserves
- Mimosa's exclusive Mineral Resources decreased since 2016 with the conversion of South Hill Mineral Resources to Mineral Reserves at the Mtshingwe Mine
- 4E refers to the summation of platinum, palladium, rhodium and gold
- 6E refers to the summation of platinum, palladium, rhodium, ruthenium, iridium and gold
- Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

### Exclusive Mineral Resources (Moz Pt)




### Exclusive Mineral Resources (Moz 4E)



# Reconciliation

The consolidated high-level reconciliation of total Mineral Resources and Mineral Reserves for the Implats Group of companies is shown below. These high-level variances are relatively small. Particulars of these variances, in addition to depletions, are illustrated in more detail in the sections by operation. Rounding of numbers may result in computational discrepancies, specifically in these high-level comparisons.

### Total Mineral Resources tonnes (million), inclusive of Mineral Reserves

| | 2013 | 2014 | 2015 | 2016 | 2017 | Variance | Attributable 2017 |
|---|---|---|---|---|---|---|---|
| **Impala*** | 592 | 458 | 457 | 442 | **502** | 61 | 471 |
| **Marula** | 102 | 100 | 108 | 106 | **127** | 21 | 93 |
| **Afplats** | 193 | 160 | 165 | 165 | **165** | – | 122 |
| **Imbasa/Inkosi** | 173 | 173 | 175 | 175 | **175** | – | 93 |
| **Two Rivers** | 108 | 105 | 353 | 350 | **317** | (34) | 155 |
| **Tamboti** | 337 | 337 | – | – | **–** | – | – |
| **Zimplats** | 2 070 | 2 066 | 2 060 | 2 068 | **2 060** | (8) | 1 793 |
| **Mimosa** | 133 | 129 | 128 | 125 | **120** | (6) | 60 |
| **Totals** | **3 709** | **3 530** | **3 445** | **3 432** | **3 466** | **22** | **2 787** |

** Includes RBR JV.*

### Total Mineral Resources (Moz Pt), inclusive of Mineral Reserves

| | 2013 | 2014 | 2015 | 2016 | Depletion | Gains and other changes | 2017 | Attributable 2017 |
|---|---|---|---|---|---|---|---|---|
| **Impala*** | 77.5 | 60.5 | 60.3 | 58.2 | (0.87) | 0.53 | **57.9** | 54.1 |
| **Marula** | 10.3 | 10.1 | 11.1 | 10.8 | (0.08) | (0.05) | **10.7** | 7.8 |
| **Afplats** | 19.3 | 16.1 | 16.6 | 16.6 | – | – | **16.6** | 12.3 |
| **Imbasa/Inkosi** | 16.0 | 16.1 | 16.3 | 16.3 | – | – | **16.3** | 8.6 |
| **Two Rivers** | 6.5 | 6.5 | 25.2 | 25.1 | (0.24) | (2.45) | **22.4** | 11.0 |
| **Tamboti** | 23.2 | 23.2 | – | – | – | – | **–** | – |
| **Zimplats** | 109.8 | 109.3 | 108.3 | 109.0 | (0.37) | (0.15) | **108.5** | 94.4 |
| **Mimosa** | 7.7 | 7.5 | 7.4 | 7.2 | (0.17) | (0.19) | **6.9** | 3.4 |
| **Totals** | **270.3** | **249.3** | **245.1** | **243.2** | **(1.7)** | **(2.3)** | **239.1** | **191.6** |

** Includes RBR JV.*

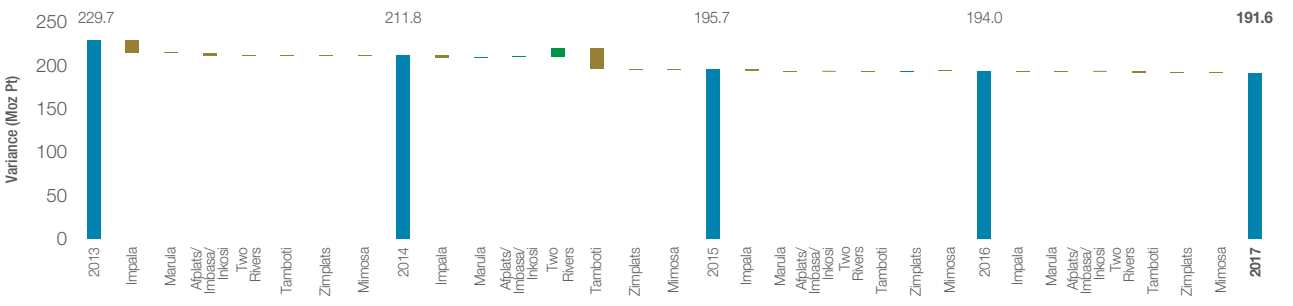
## Notes

- The Impala estimate in the above table includes the contiguous Impala/RBR JV estimate. The increase in the Impala Mineral Resource tonnage is due to the reporting change from UG2 channel width to minimum width
- Depletion was adjusted by global concentrator and mine call factors
- Potential impact of pillar factors was taken into account
- The increase in the Mineral Resource tonnage at Marula is due to the reporting change from UG2 channel width to minimum width. This is offset by the removal of the Hackney Inferred Mineral Resources
- The decrease in the Two Rivers Mineral Resources is due to the depletion and changes to the geological interpretation
- Smaller variances are mostly due to depletion and updates to the estimation models
- Overall the year-on-year Group Mineral Resource estimate has remained virtually unchanged.

The major variances in the estimated attributable Group Mineral Resources during the past five years are:

- 2013 – 2014: The application of the depth cut-off and consequent exclusion of the deeper Mineral Resources at Impala and Afplats impacted negatively on the Mineral Resource estimate
- 2014 – 2015: At Impala the employee share issue (ESOP) of 4% impacted on the effective attributable Mineral Resource estimate; and the transfer of the Tamboti rights to Two Rivers impacted positively on Two Rivers, but overall resulted in a decrease in the attributable Group Mineral Reserves
- 2015 – 2016: No material change, mostly depletion
- 2016 – 2017: No material change, mostly depletion.

### Attributable Mineral Resources



# Reconciliation

### Total Mineral Reserves tonnes (million)

| | 2013 | 2014 | 2015 | 2016 | Depletion | Gains and other changes | 2017 | Attributable 2017 |
|---|---|---|---|---|---|---|---|---|
| **Impala** | 252 | 257 | 256 | 184 | (10.1) | (5.8) | **168** | 161 |
| **Marula** | 26 | 25 | 30 | 26 | (1.5) | 0.3 | **25** | 18 |
| **Two Rivers** | 35 | 30 | 42 | 43 | (3.5) | (6.5) | **33** | 16 |
| **Zimplats** | 238 | 133 | 84 | 111 | (6.7) | 60.4 | **165** | 144 |
| **Mimosa** | 27 | 23 | 34 | 30 | (2.7) | 9.7 | **37** | 19 |
| **Totals** | **578** | **468** | **445** | **395** | **(24.6)** | **58.0** | **429** | **358** |

### Total Mineral Reserves (Moz Pt)

| | 2013 | 2014 | 2015 | 2016 | Depletion | Gains and other changes | 2017 | Attributable 2017 |
|---|---|---|---|---|---|---|---|---|
| **Impala** | 19.8 | 19.8 | 20.0 | 14.0 | (0.74) | (0.7) | **12.6** | 12.1 |
| **Marula** | 1.5 | 1.5 | 1.6 | 1.5 | (0.08) | 0.0 | **1.4** | 1.0 |
| **Two Rivers** | 1.9 | 1.7 | 2.3 | 2.3 | (0.21) | (0.4) | **1.7** | 0.8 |
| **Zimplats** | 12.5 | 7.1 | 4.5 | 5.9 | (0.35) | 3.1 | **8.6** | 7.5 |
| **Mimosa** | 1.5 | 1.2 | 1.9 | 1.7 | (0.15) | 0.5 | **2.1** | 1.0 |
| **Totals** | **37.1** | **31.3** | **30.3** | **25.4** | **(1.53)** | **2.5** | **26.3** | **22.4** |

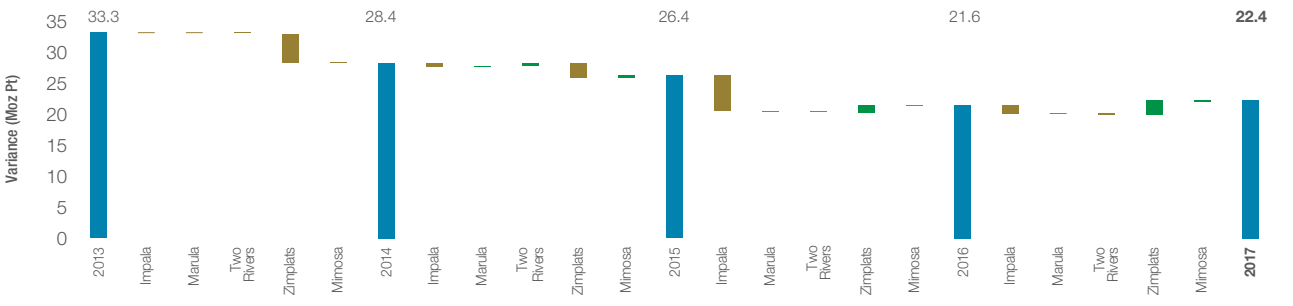
## Notes

- Depletion was adjusted by global concentrator factors
- The Mineral Reserves increased at Zimplats due to addition of the Mupani Mine (Portal 6)
- The decrease of the Two Rivers Mineral Reserves is due to the model update related to the split reef
- The increase of the Mimosa Mineral Reserves is due to the addition of the Mineral Reserves to the Mtshingwe Mine
- At Impala and Marula an economic tail-cut reduced the Mineral Reserve estimate
- Smaller changes over the past few years are mostly related to depletion.

The major variances in the estimate Group Mineral Reserves during the past five years are:

- 2013 – 2014: Aligning Zimplats with the Group standards, ie excluded Portals 6-7 from the Mineral Reserve estimate
- 2014 – 2015: Excluded Portal 5 at Zimplats from the Mineral Reserve estimate, also at Zimplats a revised pillar design impacted negatively on the Mineral Resource estimate
- 2015 – 2016: At Impala 17 Shaft was placed on care and maintenance and those Mineral Reserves were excluded
- 2016 – 2017: At Impala the economic tail-cut impacted negatively, while the addition of the Mupani Mine (Portal 6) at Zimplats effectively increased the Mineral Reserve estimate.

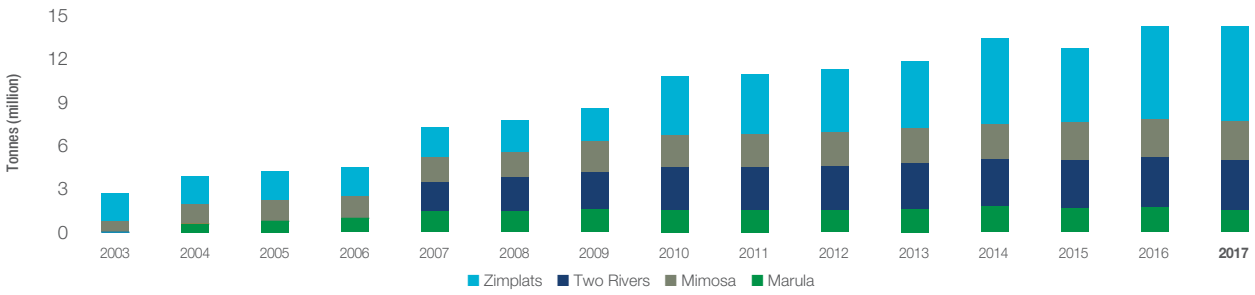
### Attributable Mineral Reserves



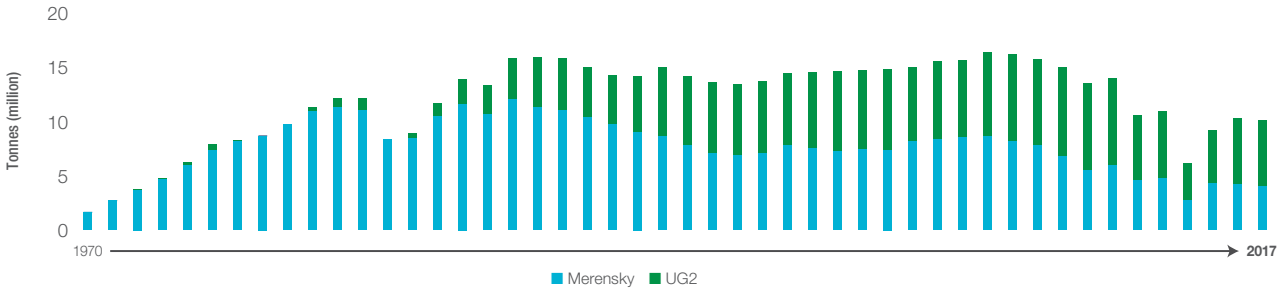
# Historic production

Summary statistics relating to the historic production of the Group is indicated in the accompanying graphs and table. Overall the gross refined platinum ounces for the Group increased from 1 438koz platinum to 1 530koz platinum.

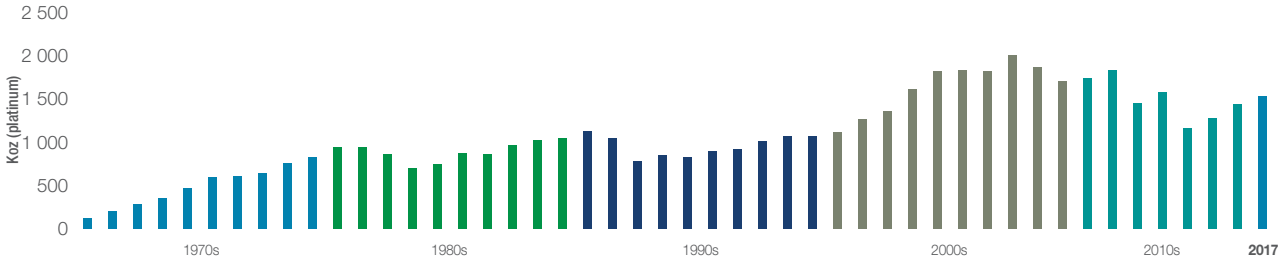
**Historic annual production at Marula, Two Rivers, Mimosa and Zimplats** (million tonnes)




**Historic annual production at Impala** (million tonnes)




**Gross Implats Pt production** (Koz platinum)



# Historic production

### Summary production statistics

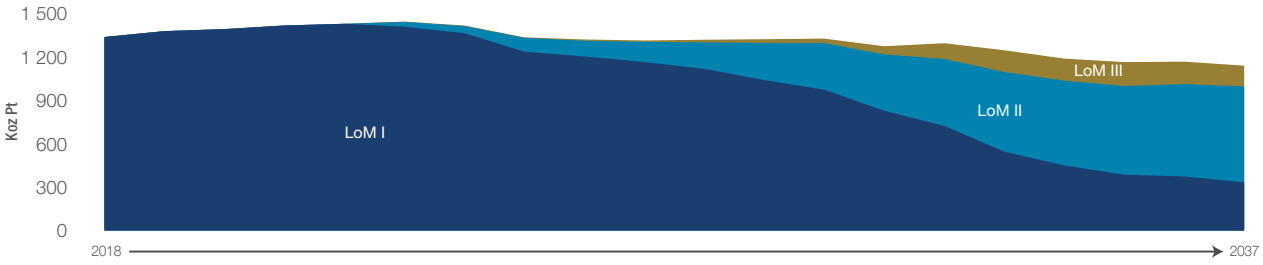
| | Units | 2017 | 2016 | 2015 | 2014 | 2013 |
|---|---|---|---|---|---|---|
| **Tonnes milled** | | | | | | |
| Impala | Kt | **10 121** | 10 316 | 9 199 | 6 183 | 10 897 |
| Marula | Kt | **1 495** | 1 703 | 1 662 | 1 794 | 1 628 |
| Two Rivers | Kt | **3 501** | 3 511 | 3 362 | 3 279 | 3 172 |
| Zimplats | Kt | **6 716** | 6 406 | 5 164 | 5 939 | 4 683 |
| Mimosa | Kt | **2 729** | 2 641 | 2 586 | 2 453 | 2 381 |
| **Mill head grade** | | | | | | |
| Impala | g/t 6E | **4.06** | 4.16 | 4.19 | 4.34 | 4.32 |
| Marula | g/t 6E | **4.26** | 4.25 | 4.19 | 4.19 | 4.19 |
| Two Rivers | g/t 6E | **3.90** | 4.06 | 3.98 | 4.01 | 4.02 |
| Zimplats | g/t 6E | **3.49** | 3.48 | 3.47 | 3.47 | 3.53 |
| Mimosa | g/t 6E | **3.83** | 3.88 | 3.93 | 3.92 | 3.95 |
| **Production ex Impala Mine*** | | | | | | |
| Platinum refined | Koz | **654.6** | 626.9 | 575.2 | 411.0 | 709.2 |
| Palladium refined | Koz | **308.1** | 299.6 | 280.7 | 197.4 | 350.5 |
| Rhodium refined | Koz | **88.7** | 81.1 | 76.7 | 50.2 | 101.3 |
| Nickel refined | t | **3 609** | 3 331 | 3 598 | 1 976 | 4 035 |
| PGM refined production | Koz | **1 246.6** | 1 219.6 | 1 137.3 | 765.9 | 1 377.9 |
| **Production ex Marula Mine*** | | | | | | |
| Platinum in concentrate | Koz | **67.9** | 77.7 | 73.6 | 78.5 | 71.7 |
| Palladium in concentrate | Koz | **69.3** | 80.3 | 75.5 | 80.5 | 73.5 |
| Rhodium in concentrate | Koz | **14.1** | 16.4 | 15.5 | 16.7 | 15.2 |
| Nickel in concentrate | t | **213** | 277 | 253 | 279 | 245 |
| PGM in concentrate | Koz | **177.6** | 204.6 | 193.3 | 206.4 | 188.3 |
| **Production ex Two Rivers Mine*** | | | | | | |
| Platinum in concentrate | Koz | **181.9** | 185.9 | 173.5 | 175.1 | 162.2 |
| Palladium in concentrate | Koz | **107.1** | 110.9 | 102.0 | 102.7 | 98.6 |
| Rhodium in concentrate | Koz | **31.8** | 33.1 | 30.6 | 31.0 | 28.7 |
| Nickel in concentrate | t | **602** | 648 | 584 | 566 | 555 |
| PGM in concentrate | Koz | **390.2** | 400.7 | 372.6 | 374.7 | 350.4 |
| **Production ex Zimplats Mine*** | | | | | | |
| Platinum in matte | Koz | **281.1** | 289.8 | 190.0 | 239.7 | 198.1 |
| Palladium in matte | Koz | **233.0** | 235.8 | 154.8 | 197.6 | 157.1 |
| Rhodium in matte | Koz | **25.4** | 27.1 | 17.4 | 22.3 | 17.0 |
| Nickel in matte | t | **5 111** | 5 434 | 3 887 | 4 830 | 3 909 |
| PGM in matte | Koz | **601.7** | 616.9 | 406.0 | 515.8 | 416.2 |
| **Production ex Mimosa Mine*** | | | | | | |
| Platinum in concentrate | Koz | **121.6** | 119.7 | 117.4 | 110.2 | 100.3 |
| Palladium in concentrate | Koz | **96.9** | 94.0 | 92.7 | 87.0 | 79.5 |
| Rhodium in concentrate | Koz | **10.5** | 9.9 | 10.2 | 9.3 | 8.7 |
| Nickel in concentrate | t | **3 441** | 3 461 | 3 470 | 3 329 | 3 161 |
| PGM in concentrate | Koz | **258.9** | 253.7 | 250.1 | 234.6 | 214.8 |
| **Gross margin** | | | | | | |
| Impala | % | **(19.9)** | (13.4) | (10.9) | (18.4) | 14.4 |
| Marula | % | **(36.3)** | (23.7) | (13.4) | (0.7) | (15.4) |
| Two Rivers | % | **27.3** | 27.5 | 27.7 | 29.5 | 22.1 |
| Zimplats | % | **18.3** | 8.2 | 10.3 | 34.1 | 34.9 |
| Mimosa | % | **5.2** | (3.3) | 22.9 | 19.3 | 24.2 |
| **Gross Implats refined production**** | | | | | | |
| Platinum | Koz | **1 530** | 1 438 | 1 276 | 1 178 | 1 582 |
| Palladium | Koz | **932** | 885 | 792 | 710 | 1 020 |
| Rhodium | Koz | **204** | 185 | 172 | 157 | 220 |
| Nickel | Kt | **17.5** | 17.0 | 15.9 | 13.9 | 16.0 |

** Numbers reflect 100% of production and not the portion attributable to Implats.*
*** Includes IRS production from other sources.*

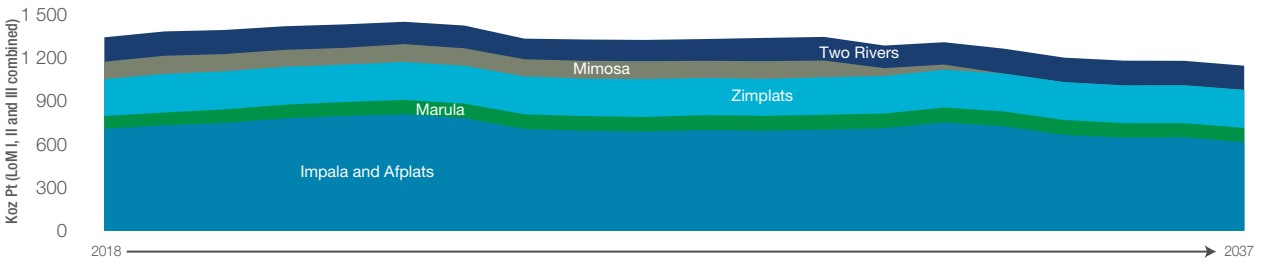
# Life-of-mine production

The high-level LoM (20-year) plan is depicted in the detailed sections per operation in terms of planning levels I, II and III. These graphs reflect 100% of the annual production forecasts and not the portion attributable to Implats. These do not include all the "Blue Sky" opportunities – some of this potential is specifically excluded at this early stage. Caution should be exercised when considering the LoM plans as these may vary if assumptions, modifying factors, exchange rates or metals prices change materially. These LoM profiles should be read in conjunction with Mineral Resource estimates to determine the long-term potential. The graphs below show the consolidated high-level LoM plans collated from the individual profiles per operation. The pictorial 20-year profiles are shown as a combination of levels I, II and III and also the contribution by operation. Only LoM I is based on Mineral Reserves while LoM II and III have not been converted to Mineral Reserves. There are no Inferred Mineral Resources included in the LoM I and Mineral Reserve estimates. Note that Afplats is the only non-producing operation included in these combined profiles. Shaft sinking operations at Leeuwkop (Afplats) and 17 Shaft at Impala have been deferred in terms of the current financial constraints and strategic review. Both Leeuwkop and 17 Shaft profiles have been included in the LoM II for Impala. It is clear from a combined view that a large proportion of the 20-year plan is still at Levels II and III and would require an improved financial outlook, further studies, funding and capital approval by the board.

**Implats Group 20-year Pt ounce profile**




**Implats Group 20-year Pt ounce profile** (combined LoM I, II and III)



# Impala

**Hans Merensky** first recognised platinum on the **eastern limb of the Bushveld Complex** in 1924. In 1925 Merensky further discovered the **Merensky Reef** in an arc from Brits through Rustenburg to Thabazimbi. This arc became the **Western Bushveld Complex** and the **location of Impala Platinum**.

## History

In 1965 Union Corporation purchased a company called Impala Prospecting Company. The first six test boreholes were drilled during 1965. The first vertical shaft (62m) was developed in 1967 to obtain a bulk Merensky sample. Impala Platinum Limited was created on 26 April 1968, as a subsidiary of Union Corporation.

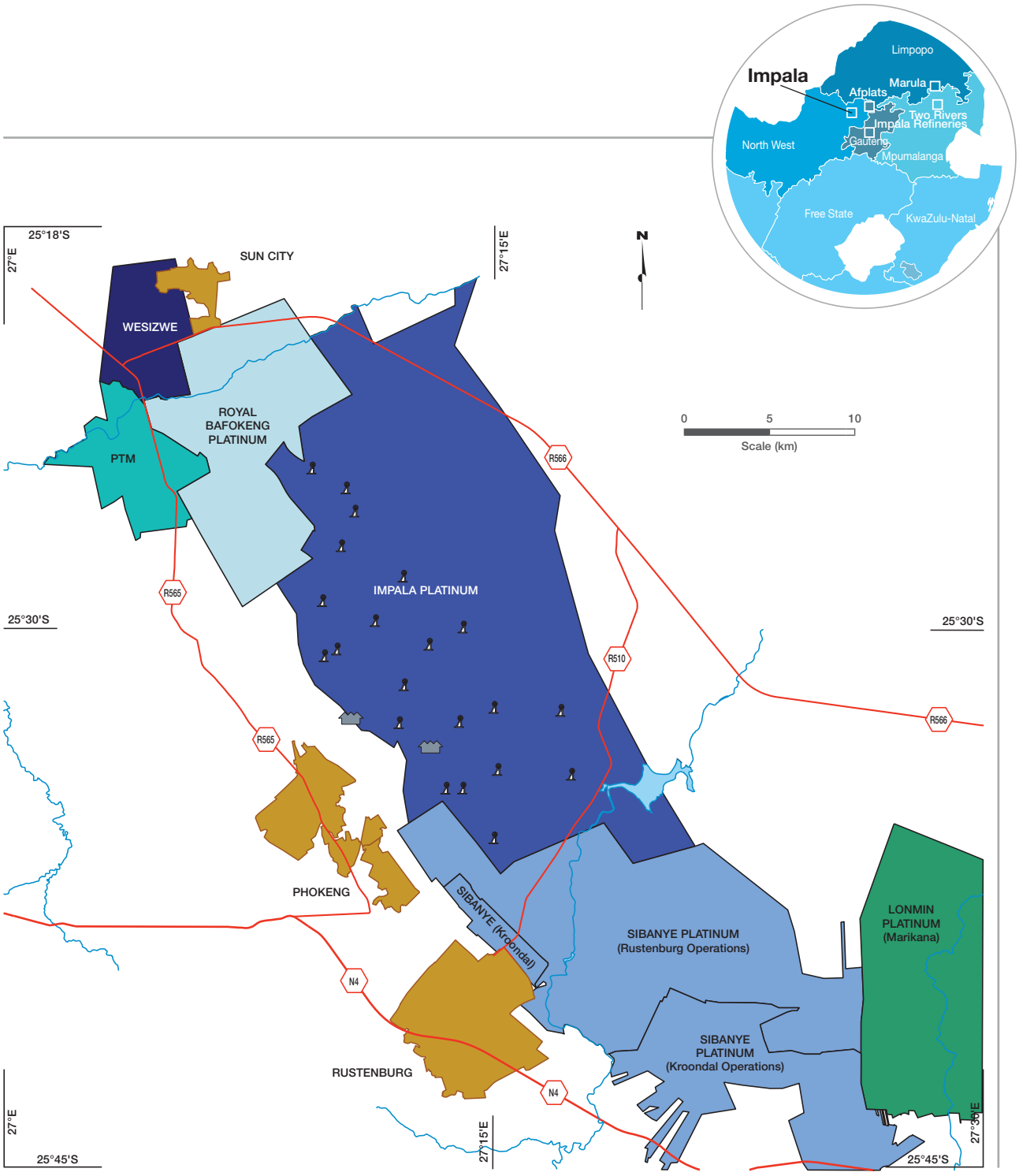
Initial production commenced on 22 July 1969 after a mining lease over land predominantly owned by the then Bafokeng Tribe (now the Royal Bafokeng Nation (RBN)) was originally granted in 1968. Initially Impala mined the Merensky Reef and the mining of the UG2 Reef only began in the early 1980s as the technology to smelt ore containing chromitite at a higher temperature was developed. By the early 1990s, 13 vertical shafts were in operation and Impala was producing in the region of one million platinum ounces per annum. Shaft sinking at the new generation shafts (16, 17 and 20) commenced in the mid-2000s.

# Impala

## Location

Impala Platinum is located 25km north-west of the town of Rustenburg in the North West province and 140km west of Pretoria in the Gauteng province. The Rustenburg region is known as the so-called platinum belt with vast proportions of world wide platinum production traditionally being produced from this area. Sibanye Platinum is located to the immediate south of the Impala operation and Royal Bafokeng Platinum is situated adjacent to the northern boundary of the Impala operation.

### Regional locality map showing PGM mineral rights and infrastructure at Impala



# Impala

## Mineral rights

A landmark agreement securing Impala's access to these mineral rights for a period of 40 years was signed with the RBN in February 1999. In terms of this agreement, the RBN was entitled to royalties from metals mined in areas over which they held mineral rights. A new agreement, finalised in early March 2007, resulted in the royalty being converted into equity, making the RBN the Group's largest shareholder with board representation at the time. In terms of the March 2007 agreement, Impala agreed to pay RBN all royalties due to them from 1 July 2007 onwards. This amounted to R12.5 billion. Effectively, through this transaction, Impala discharged its future obligation to pay royalties to the RBN. The RBN, through Royal Bafokeng Holdings Limited (RBH), used the R12.5 billion to subscribe for 75.1 million Implats shares giving them a 13.2% share in the holding company at the time. During the financial year 2016 the RBH sold 5% of the Implats shares and now effectively owns 6.3% of the Company. In 2015, 4% of the Impala shares were issued to employees (ESOP transaction), leaving Implats with a 96% attributable interest in Impala. The mining rights at Impala were converted into new-order rights in 2008 and awarded for a 30-year period, at which time the MPRDA allows for an extension. Impala holds contiguous mining and prospecting rights over a total area of 33 562ha across 20 farms, or portions of farms, which includes a joint venture with the Royal Bafokeng Resources (RBR) on a prospecting right area of 3 789ha.

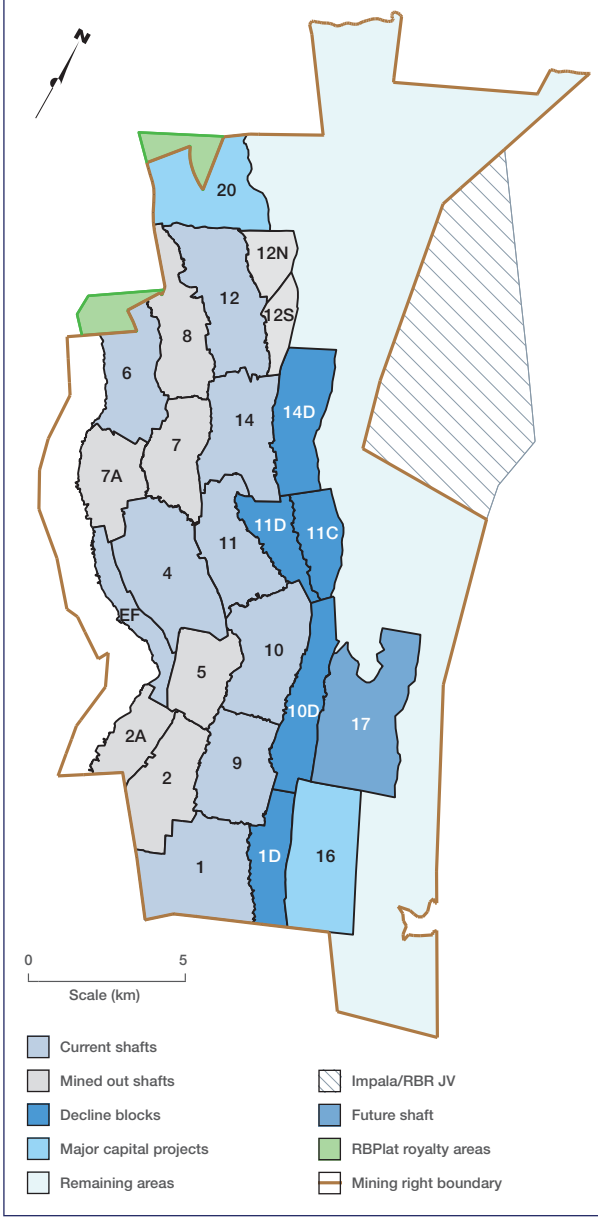
## Infrastructure

Impala Platinum is an established mine with infrastructure that includes tarred roads, shaft areas, buildings, offices, railway lines, powerlines, pipelines, sewage and rock and tailings dumps. The extent of the servitude area that constitutes the infrastructure, roads, rails and dumps is 46.23km$^2$. The network of surface rail infrastructure between the various shaft heads, two concentrators and a smelter consists of about 92km of rail.

The Impala operations are supplied with electricity by Eskom primarily from its Ararat Main Transmission Sub-station (MTS). The total installed capacity at Ararat MTS amounts to 945MVA. The operations have an adequate and firm electricity supply and distribution network. At present, there are eight main intake points on Impala, all of which have adequate redundancy. These intake points are supplied by Eskom at 88kV. The voltage is then transformed to 33kV and 6.6kV for surface and underground distributions. Eskom also has dedicated transformers at some of these sub-stations to convert the voltage to 11kV to supply electricity to the neighbouring communities. An alternate source of electricity for Impala is the Marang MTS, connected to the Impala 16 Shaft, to provide electricity during emergency conditions.

Rand Water supplies water to Rustenburg and Impala from the Vaal River system (Vaal Dam). The licence allocation is 32Ml per day. Rand Water is also supplying 3Ml water per day to Impala from the Magalies Water system. Magalies Water supplies water to Rustenburg and Impala from the Crocodile River system (Vaalkop Dam). The total potable water allocation to the Impala operation is 40Ml per day. The total allocation was 42Ml per day but 2Ml per day is now allocated to the new Platinum village. Impala has a contract to receive 10Ml treated effluent (grey water) per day from the Rustenburg municipal water care works for the two processing plants. The three water care works at Impala also supply about 3 to 5Ml of treated effluent per day to the Mineral Processes operations. Impala does not have major reservoirs and is dependent on the direct feed from the two providers.

**Impala location of shafts and projects**



# Impala

## Environmental

Impala is ISO 14001 certified. In line with the environmental management system expectations, all areas are required to identify and report on environmental incidents. Systems are in place to investigate and determine the direct and root causes of high-severity incidents and to address and close out these incidents.

It is a business imperative to exercise responsible environmental management, particularly as the underground operations become deeper and consume more energy and water. This involves taking measures to address security of resource supply (for example through efficiency, recycling and fuel-switching) and to actively minimise the impacts on natural resources and on the communities around the operations. Taking these measures has direct benefits in terms of reduced costs and liabilities, enhanced resource security and the improved security of the licence to operate.

Management of the environmental impacts of the operations and processes involves the following focus areas:

- Promoting responsible water stewardship by minimising water use and water pollution
- Minimising our negative impacts on air quality
- Responding to climate change risks and opportunities and promoting responsible energy management
- Managing our waste streams
- Promoting responsible land management and biodiversity practices.

All of the tailings currently produced by the concentrator plants are deposited on the No 4 tailings dam, which is one of the largest in South Africa with a base area of about 750 hectares. The projected life of the dam is at least another 30 years. The height of the walls varies between 40m at the lowest part to 72m at the highest. At closure, it is expected that the highest wall will reach 120m. Water is decanted for recycling back to the concentrators via two concrete penstock towers. The towers are 5.5m in diameter and are currently 40m above the pool. They are connected to two decant pipes of 1.25m diameter that route the water to the north and south return water pump stations.


*Underground chairlift at Impala*

# Impala

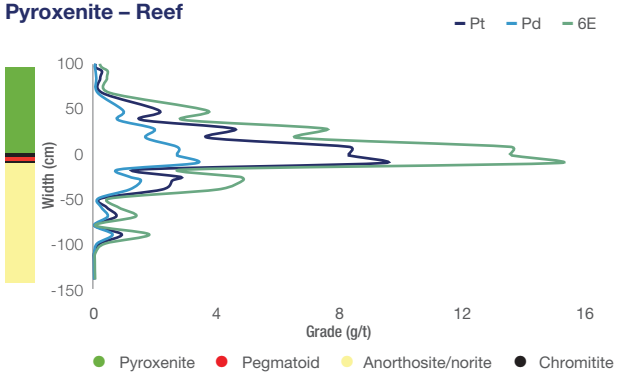
## Geology

The geological succession is illustrated in the generalised stratigraphic column. The Merensky and UG2 Reefs are separated by a sequence of mostly anorthositic and noritic layered units of some 45m to 125m in combined thickness. Both the Merensky and UG2 Reefs are exploited at Impala. The Merensky Reef is generally composed of an upper feldspathic pyroxenite, overlying a thin basal chromitite stringer, followed by an anorthosite to norite footwall. Locally this is termed a "pyroxenite reef". Occasionally a pegmatoidal pyroxenite and a second chromitite stringer may be developed between the feldspathic pyroxenite and the footwall units. This is termed a "pegmatoid reef". As an aid to mining operations the Merensky Reef is further defined as being "A", "B" or "C" Reef where it rests on specific footwall units – locally called Footwall 1, 2 and 3 respectively.

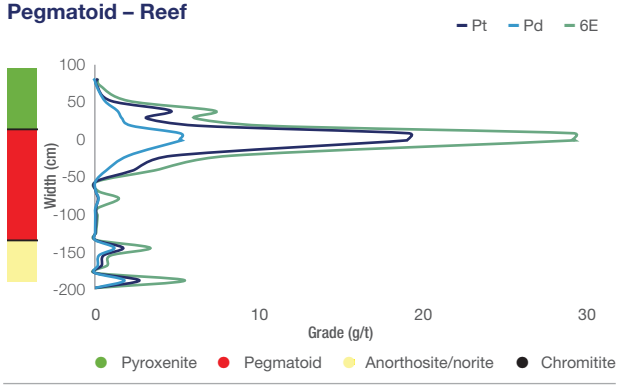
The UG2 Reef is defined as a main chromitite layer, with most of the PGM and base metal mineralisation confined to this unit, followed by a poorly mineralised pegmatoidal pyroxenite footwall. The hangingwall to the main chromitite layer is a feldspathic pyroxenite containing up to four thin, poorly mineralised chromitite layers. The vertical grade distribution is depicted in the accompanying graphs, notably showing peak values at reef contacts in association with chromitite. The average 6E metal ratios show the distinct differences between the Merensky and UG2 Reefs, in particular the higher Pt:Pd ratio associated with the Merensky Reef and the relative high proportion of rhodium in the UG2 Reef.

Both mineralised horizons dip gently away from the sub-outcrop in a north-easterly direction at 10° to 12°. The vertical separation between the Merensky and UG2 Reefs varies from about 125m in the south to 45m in the north of the mining area. The reefs may be disrupted by minor and major faults, lamprophyre, syenite and dolerite dykes, late stage ultramafic replacement pegmatoid bodies and potholes. The latter features are generally circular in shape and represent "erosion" or "slumping" into the footwall units. They vary in size from a few metres to tens of metres across and up to tens of metres in depth. All of these features are accounted for in the Mineral Resource and Mineral Reserve Statements as geological losses and they contribute to dilution or absence of the mineralised horizons when converted to Mineral Reserves through the planning process.

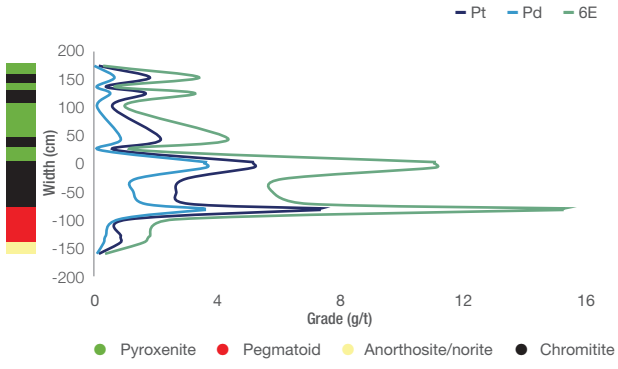
**Impala – Merensky**
**Pyroxenite – Reef**



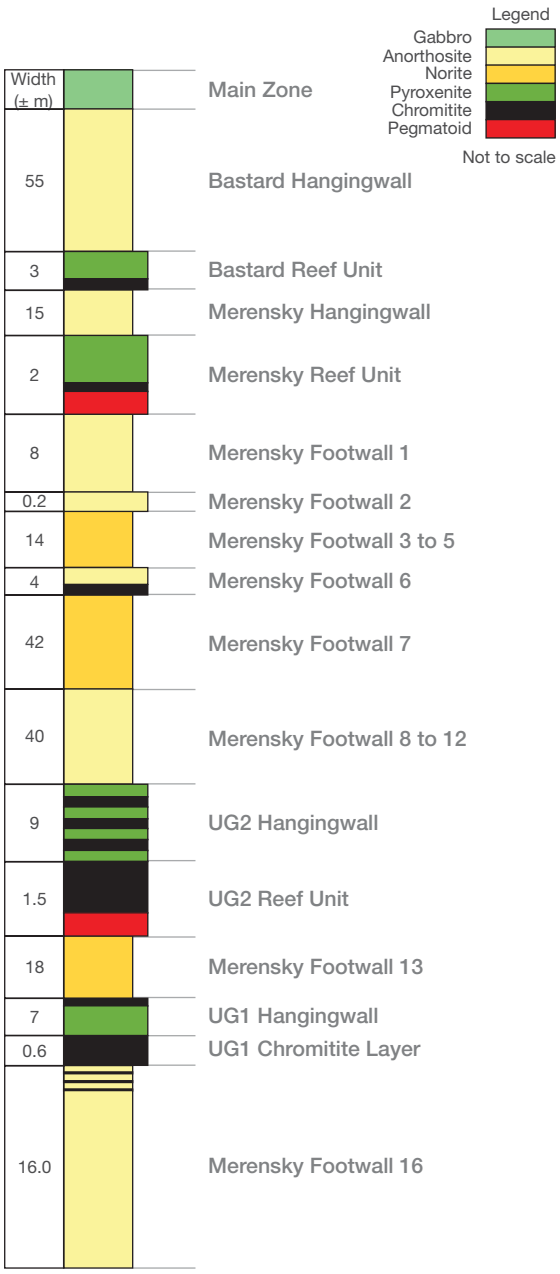

**Impala – Merensky**
**Pegmatoid – Reef**




**Impala – UG2**

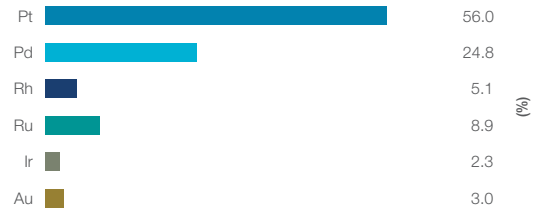


# Impala

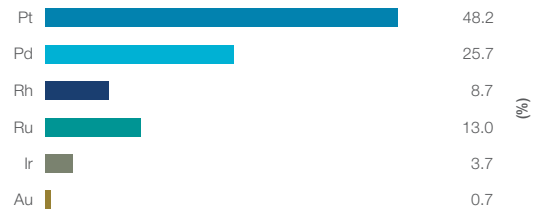


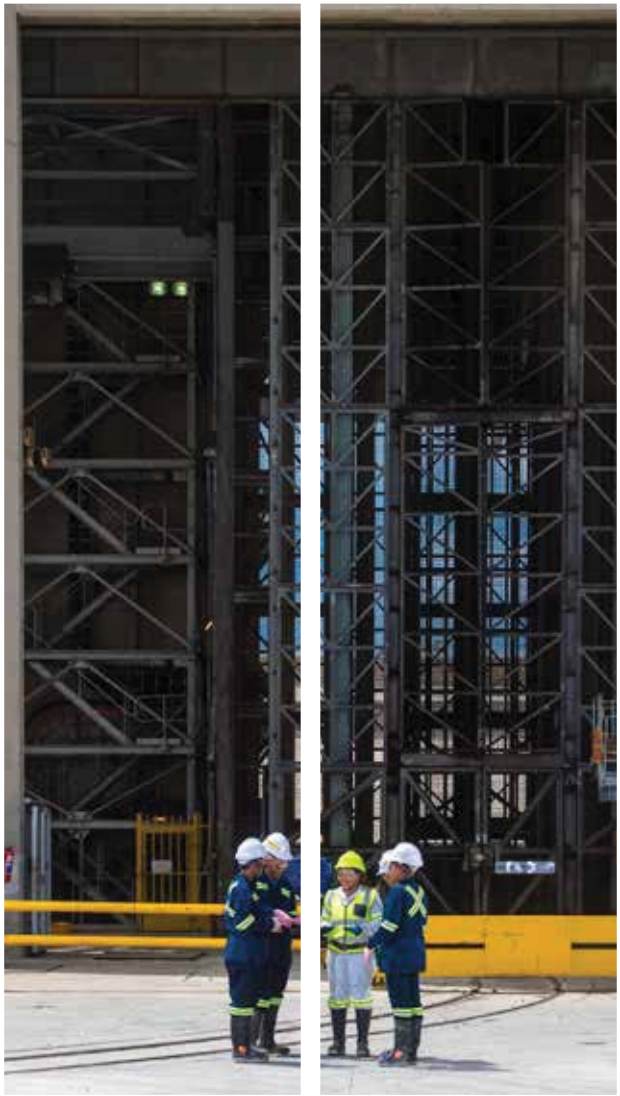

GENERALISED GEOLOGICAL SUCCESSION OF THE UPPER PORTION OF THE CRITICAL ZONE: IMPALA

## Impala Merensky 6E metal ratio




## Impala UG2 6E metal ratio

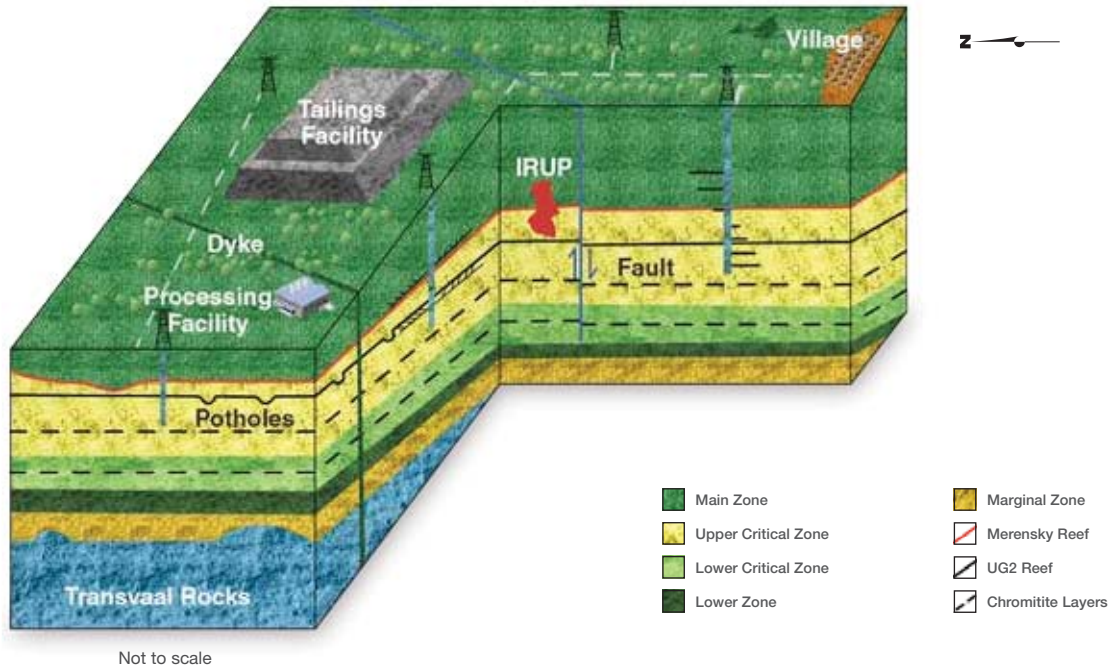


*16 Shaft Bank Area*

# Impala

A schematic diagram illustrating the broader geological succession relative to major shaft infrastructure is shown below.




Not to scale

## Exploration

Exploration activities at Impala typically comprise geological mapping (surface and underground), geophysical surveys (areomagnetics, 3D vibroseis) and core-recovering drilling (surface and underground). Surface drilling is typically infill work to supplement a broader grid of 500m spacing completed during feasibility stages. Such work is mostly targeted to assist with detailed structural interpretations.

Underground geotechnical core-recovering drilling activities is routinely being undertaken at Impala to assist with detecting potential hazardous geological features and to assist with guiding mining operations. Underground drilling is typically employed to keep the footwall drives at the ideal elevation and to resolve structural complexities.

The work conducted in the past year is summarised in the overview exploration section of this report.

## Mineral Resource estimation and reconciliation

Mineral Resources are reported inclusive of Mineral Reserves. Mineral Resource grades are shown for both 4E and 6E. Mineral Resource estimates allow for estimated geological losses but not for anticipated pillar losses during eventual mining. The introduction of a depth cut-off was noted in previous reports and no Mineral Resources deeper than 2 000m below surface are reported. In addition to the depth cut-off areas, various Mineral Resource blocks are considered on a case-by-case basis and this has resulted in the identification of areas where the eventual economic extraction is in doubt.

The Mineral Resource estimation method is ordinary kriging. The evaluation is conducted using on-reef development sampling as well as borehole samples which are defined by an optimal grid. The geostatistical evaluation is done to establish a Mineral Resource estimate for both short and long-term planning.

The Mineral Resource classification is based on a Group standard practice that considers the quality of the data, the continuity of the reef, if a seismic survey covers the area or not, the data spacing, and the geostatistical parameters.

# Impala

## Impala Mineral Resources – 100% (inclusive reporting)

as at 30 June 2017

| as at 30 June 2017 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | | UG2 | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 132.3 | 68.8 | 21.2 | 222.3 | 165.0 | 71.0 | 20.8 | 256.9 | **479.1** |
| Width | cm | 122 | 108 | 99 | | 95 | 95 | 95 | | |
| 4E grade | g/t | 6.30 | 6.31 | 6.93 | 6.36 | 5.48 | 5.50 | 5.40 | 5.48 | **5.89** |
| 6E grade | g/t | 7.09 | 7.11 | 7.80 | 7.16 | 6.57 | 6.60 | 6.49 | 6.57 | **6.85** |
| Ni | % | 0.16 | 0.18 | 0.18 | 0.17 | 0.04 | 0.05 | 0.04 | 0.04 | **0.10** |
| Cu | % | 0.09 | 0.09 | 0.10 | 0.09 | 0.01 | 0.01 | 0.01 | 0.01 | **0.05** |
| 4E oz | Moz | 26.8 | 14.0 | 4.7 | 45.5 | 29.1 | 12.6 | 3.6 | 45.2 | **90.7** |
| 6E oz | Moz | 30.2 | 15.7 | 5.3 | 51.2 | 34.9 | 15.1 | 4.3 | 54.3 | **105.5** |
| Pt oz | Moz | 16.9 | 8.8 | 3.0 | 28.6 | 16.8 | 7.3 | 2.1 | 26.1 | **54.8** |
| Pd oz | Moz | 7.5 | 3.9 | 1.3 | 12.7 | 9.0 | 3.9 | 1.1 | 13.9 | **26.6** |

| as at 30 June 2016 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | | UG2 | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 141.0 | 69.1 | 23.3 | 233.3 | 122.8 | 49.6 | 14.7 | 187.2 | **420.5** |
| Width | cm | 123 | 108 | 110 | | 63 | 62 | 63 | | |
| 4E grade | g/t | 6.31 | 6.29 | 6.36 | 6.31 | 7.32 | 7.35 | 7.17 | 7.32 | **6.76** |
| 6E grade | g/t | 7.10 | 7.08 | 7.15 | 7.10 | 8.78 | 8.83 | 8.60 | 8.78 | **7.85** |
| Ni | % | 0.15 | 0.18 | 0.16 | 0.16 | 0.02 | 0.03 | 0.03 | 0.02 | **0.10** |
| Cu | % | 0.08 | 0.09 | 0.09 | 0.09 | 0.01 | 0.01 | 0.01 | 0.01 | **0.05** |
| 4E oz | Moz | 28.6 | 14.0 | 4.8 | 47.3 | 28.9 | 11.7 | 3.4 | 44.0 | **91.3** |
| 6E oz | Moz | 32.2 | 15.7 | 5.3 | 53.2 | 34.7 | 14.1 | 4.1 | 52.8 | **106.1** |
| Pt oz | Moz | 18.0 | 8.8 | 3.0 | 29.8 | 16.7 | 6.8 | 2.0 | 25.5 | **55.3** |

| as at 30 June 2017 | | | |
|---|---|---|---|
| Orebody category | | 1 and 2 tailings complex | |
| | | Indicated | Total |
| Tonnes | Mt | 48.1 | **48.1** |
| Pt grade | g/t | 0.42 | **0.42** |
| Pt oz | Moz | 0.6 | **0.6** |

| as at 30 June 2016 | | | |
|---|---|---|---|
| Orebody category | | 1 and 2 tailings complex | |
| | | Indicated | Total |
| Tonnes | Mt | 48.1 | **48.1** |
| Pt grade | g/t | 0.42 | **0.42** |
| Pt oz | Moz | 0.6 | **0.6** |

# Impala

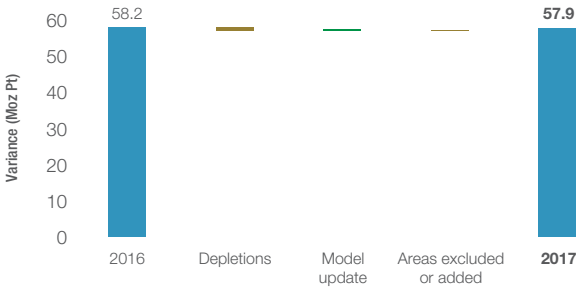
## Impala/Royal Bafokeng Resources Platinum JV Mineral Resources
as at 30 June 2017

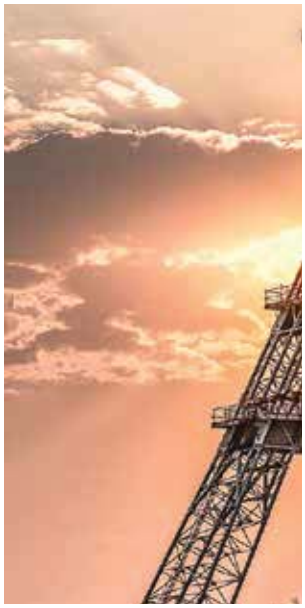
| as at 30 June 2017 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | | UG2 | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 5.2 | 5.4 | 3.7 | 14.4 | 2.5 | 3.6 | 2.8 | 8.9 | **23.2** |
| Width | cm | 151 | 151 | 103 | | 95 | 95 | 95 | | |
| 4E grade | g/t | 6.73 | 7.13 | 7.71 | 7.14 | 5.23 | 6.17 | 6.74 | 6.08 | **6.73** |
| 6E grade | g/t | 7.57 | 8.03 | 8.68 | 8.03 | 6.28 | 7.41 | 8.08 | 7.30 | **7.75** |
| Ni | % | 0.17 | 0.16 | 0.19 | 0.17 | 0.02 | 0.04 | 0.05 | 0.04 | **0.12** |
| Cu | % | 0.10 | 0.10 | 0.11 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | **0.06** |
| 4E oz | Moz | 1.1 | 1.2 | 0.9 | 3.3 | 0.4 | 0.7 | 0.6 | 1.7 | **5.0** |
| 6E oz | Moz | 1.3 | 1.4 | 1.0 | 3.7 | 0.5 | 0.9 | 0.7 | 2.1 | **5.8** |
| Pt oz | Moz | 0.7 | 0.8 | 0.6 | 2.1 | 0.2 | 0.4 | 0.3 | 1.0 | **3.1** |
| Pd oz | Moz | 0.3 | 0.3 | 0.3 | 0.9 | 0.1 | 0.2 | 0.2 | 0.5 | **1.5** |

| as at 30 June 2016 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | | UG2 | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 5.2 | 5.4 | 5.1 | 15.7 | 1.5 | 2.3 | 1.6 | 5.5 | **21.2** |
| Width | cm | 151 | 151 | 142 | | 53 | 57 | 51 | | |
| 4E grade | g/t | 6.72 | 7.17 | 6.75 | 6.89 | 7.34 | 7.77 | 7.09 | 7.45 | **7.03** |
| 6E grade | g/t | 7.56 | 8.06 | 7.60 | 7.75 | 8.81 | 9.32 | 8.51 | 8.94 | **8.05** |
| Ni | % | 0.17 | 0.16 | 0.17 | 0.17 | 0.03 | 0.03 | 0.04 | 0.03 | **0.13** |
| Cu | % | 0.10 | 0.10 | 0.10 | 0.10 | 0.00 | 0.00 | 0.00 | 0.00 | **0.07** |
| 4E oz | Moz | 1.1 | 1.2 | 1.1 | 3.5 | 0.4 | 0.6 | 0.4 | 1.3 | **4.8** |
| 6E oz | Moz | 1.3 | 1.4 | 1.2 | 3.9 | 0.4 | 0.7 | 0.4 | 1.6 | **5.5** |
| Pt oz | Moz | 0.7 | 0.8 | 0.7 | 2.2 | 0.2 | 0.3 | 0.2 | 0.8 | **2.9** |

The overall reconciliation based on the platinum content of the Mineral Resource estimate indicates that there has been no material change since the previous report. The UG2 Mineral Resources have been estimated using a minimum mining cut of 95cm and not the main chromitite layer of 65cm indicated as model update to the reconciliation. It adds significant dilution but very little metal is added. Both styles of reporting were reported in June 2016; the current format provides more clarity.

**Total Impala Mineral Resources (including RBR JV Mineral Resources)**



*8 Shaft, Impala*

# Impala

## Modifying factors

Key modifying factors such as overbreak, underbreak, off-reef mining, development dimensions, sweepings and mine call factors are applied to the mining area (centare profile) to generate tonnage and grade profiles. The modifying factors used to convert a Mineral Resource to a Mineral Reserve are derived from historical performance while taking future anticipated conditions into account.

### Key factors and assumptions

| Merensky Reef | Factors | Implats long-term price assumptions in today's money used by Implats for all the operations** | | |
|---|---|---|---|---|
| Geological losses | 20 – 25% | Platinum | US$/oz | 1 300 |
| Mineral Resource area | 64 million ca's | Palladium | US$/oz | 900 |
| Pillar factors | 8 – 10% | Rhodium | US$/oz | 1 100 |
| Resource dilution | 9 – 12% | Ruthenium | US$/oz | 55 |
| Mine call factor | 90 – 92% | Iridium | US$/oz | 630 |
| Relative density | 3.05 – 3.25 | Gold | US$/oz | 1 100 |
| Channel width | 115cm | Nickel | US$/t | 14 000 |
| Stoping width | 135cm | Copper | US$/t | 6 700 |
| Concentrator recoveries | 88 – 89% | Exchange rate | R/US$ | 13.88 |

| UG2 Reef | Factors | | 6E metal ratio (%) | |
|---|---|---|---|---|
| Geological losses | 30 – 40% | | Merensky | UG2 |
| Mineral Resource area | 72 million ca's | Platinum | 56.0% | 48.2% |
| Pillar factors | 7 – 13% | Palladium | 24.8% | 25.7% |
| Resource dilution | 9 – 12% | Rhodium | 5.1% | 8.7% |
| Mine call factor | 88 – 90% | Ruthenium | 8.9% | 13.0% |
| Relative density | 3.7 – 3.8 | Iridium | 2.3% | 3.7% |
| Channel width | 95cm | Gold | 3.0% | 0.7% |
| Stoping width | 106cm | **Implats interest** | **Mining right (ha)** | **Prospecting right (ha)** |
| Concentrator recoveries | 79 – 82% | Impala | 96% | 29 773 | – |
| | | Impala RBR JV | 49% | – | 3 789 |

*** Supporting the Mineral Reserve estimates.*

*UG2 Plant, Impala*

# Impala

## Mining flexibility at Impala

Creating and maintaining mining flexibility is a key business imperative to ensure effective, safe and productive mining. One of the mining flexibility measures at conventional stoping sections is the mineable face length. These are stoping faces that can immediately be exploited without any further development or equipping. Progress of such flexibility is managed in detail. The target is to have a flexibility of 1.5, in other words, to have three mineable panels for every two stoping teams. Progress has been made in the past four years with the total mineable face length at Impala having increased from 17.8km in 2012 to some 21.9km in 2016. There has been a regression in the past year in the total mineable face length to 19.1km. The negative impact can be ascribed to the economic assessment of certain unmined areas ("white areas") and the decision to exclude these from mine plans and the impact of shorter panels in certain ground condition zones on the UG2 Reef horizon where the utilisation of face length is less effective. A general constraint at depth at 16 Shaft dictates "just in time ledging and equipping" that precludes the accumulation of a mineable face inventory. On-reef development targets were not achieved in FY17, this also impacted the overall mineable face length. On average the panel to stoping team ratio at year end was 1.4, the focus areas remain 12, 14, 16 and 20 Shafts.

The second measure of mining flexibility relates to the "Mineable Reserves", which is defined as that part of the orebody that has been accessed by main grid development, in particular that areas where raise/winze holings have been effected (this is a local operational term and should not be confused with the SAMREC terminology). The "Mineable Reserves" are measured as (a) the total reef area exposed by development and measured in centares, and (b) a traditional high-level ratio of "months Mineable Reserves". The term "months Mineable Reserves" is merely the total reef area divided by the average monthly area planned (centares per month). The graph below depicts the overall status with a slight increase in the overall "Mineable Reserves" during the past five years, also an achieved factor of more than 30 "months Mineable Reserves". This relates well against a general industry norm of 24 months "Mineable Reserves".

Mineable face length and "months Mineable Reserves" are two different measures and cannot be directly compared.

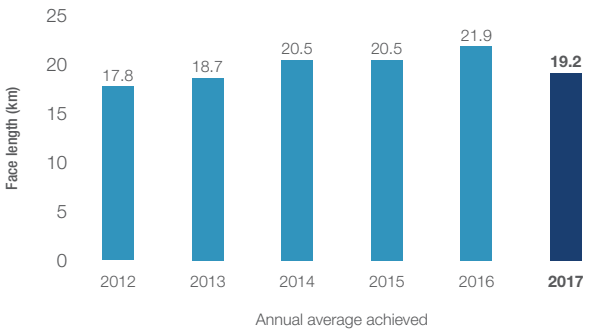
## Mining methods and mine planning

The Merensky and UG2 Reefs are mined concurrently at Impala. The mining method is predominantly conventional breast mining. Stoping at the operations is carried out through conventional double-sided breast mining in accordance with Impala's best practice principles. The access haulages are developed in opposite directions from cross-cuts connected to a central shaft position, following the two reef horizons on strike in the footwall of the reefs and are defined as half levels. Footwall drives are developed at approximately 18m to 30m below the reef horizon with on-reef raise/winze connections being between 180m and 250m apart.

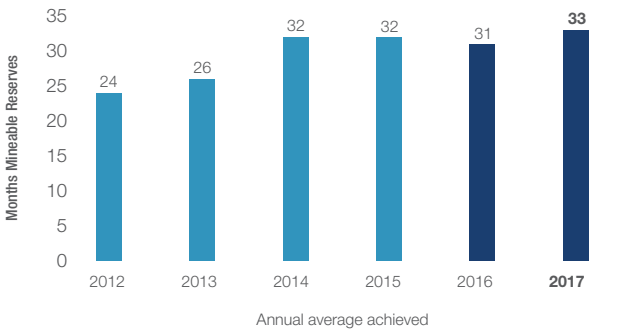
Panel face lengths vary from 15m to 30m for both Merensky and UG2 Reefs, with panels being typically separated by 6m x 3m grid pillars with 2m ventilation holes. Stoping widths are approximately 1.3m and 1.1m for conventional Merensky and UG2 Reefs respectively, depending on the width of the economical reef horizon. Mechanised (trackless) bord and pillar mining occurs in selected Merensky Reef areas at 14 Shaft. The average stoping width of the mechanised panels is about 1.9m.

Mine design and scheduling of operational shafts is undertaken using CADSmine™ software, while the mine

**Mineable face length at Impala**




**Impala – Months Mineable Reserves**



# Impala

design and scheduling for project shafts are done using Mine 2-4D™ software. Geological models/ore blocks are updated and validated using G-Blocks and boundaries in the MRM information system. Grade block models are developed using Isatis™ software. The mine design for the first two years is monthly per crew. This is extended on an annual basis for the remaining period of the LoM.

The planning sequence allows for a cycle that starts with a comprehensive review of the LoM plan followed by the detailed scheduling of a five-year development schedule and a two-year detailed month-by-month stoping schedule.

## Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimates are tabulated in the statement on page 56 and reflects the total Mineral Reserve estimate for Impala as at 30 June 2017. Mineral Reserve grades are quoted after applying mine to mill modifying factors. Current Mineral Reserve estimates have included the latest drilling, assay results, mine design and updated modifying factors.

The Mineral Reserves quoted reflect anticipated grades delivered to the mill and estimations are aligned to the business plan by estimating tonnes and grades at an average 135cm mining width for the Merensky Reef and an average 107cm mining width for the UG2 Reef.

Rounding of numbers may result in minor computational discrepancies. The results tabulated in this report must be read as estimates and not as calculations.

The conversion and classification of Mineral Reserves at Impala is informed by:

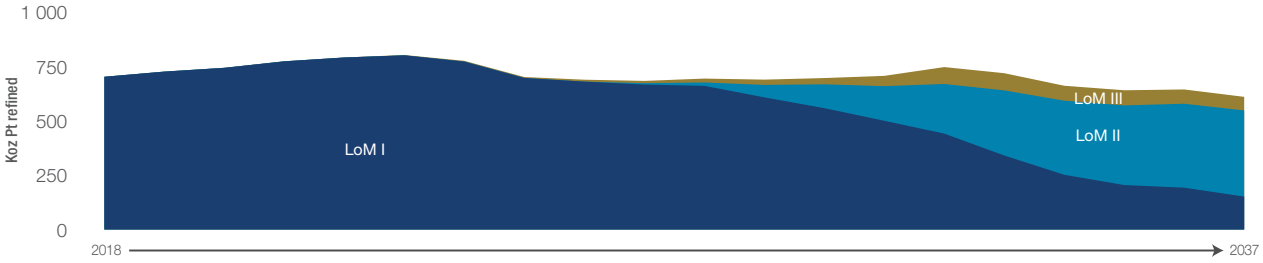
- Feasible mine plan and project studies, board approval and available funding
- Economic testing at given market conditions (price deck)
- Measured Mineral Resources are classified as Proved and Probable Mineral Reserves if the mine plan passed economic testing and is approved for funding
- Proved Mineral Reserves are those areas where the main development has been completed and a considerable amount of the geological losses have been discounted
- No Inferred Mineral Resources are converted to the Mineral Reserve category.

Mineral Reserve grades are shown for both 4E and 6E. The Mineral Reserves quoted reflect the grade delivered to the mill. The Mineral Resources and Mineral Reserves involved with the royalty agreement with RBPlat are excluded in this report as the ownership vests with RBPlat. This refers to the agreement with RBPlat to access certain of its mining areas at BRPM from the Impala 6 and 20 Shafts.

An economic profitability test was conducted at each shaft, in particular also to conduct so-called tail-cutting at the end of a shaft's life. The impact varies from shaft to shaft, on average some 3% of the Mineral Reserves have now been excluded in the accompanying statement based on such economic reviews. The impact is more pronounced on the UG2 estimates at Impala.

Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

**Impala 20-year LoM Pt ounce profile**



# Impala

## Impala Mineral Reserves – 100%

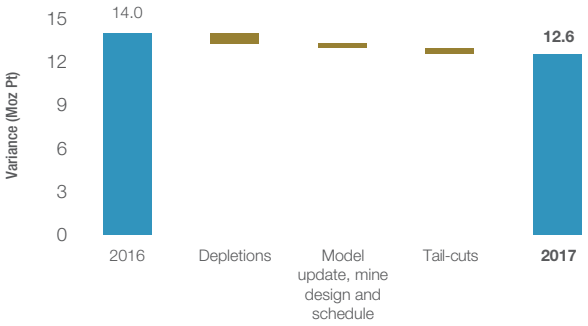
as at 30 June 2017

| as at 30 June 2017 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky Proved | Merensky Probable | Merensky Total | UG2 Proved | UG2 Probable | UG2 Total | Total |
| **Tonnes** | Mt | 10.6 | 65.2 | 75.8 | 13.4 | 78.7 | 92.1 | **167.9** |
| **Width** | cm | 135 | 136 | | 108 | 106 | | |
| **4E grade** | g/t | 3.83 | 4.12 | 4.08 | 3.74 | 3.67 | 3.68 | **3.86** |
| **6E grade** | g/t | 4.31 | 4.63 | 4.59 | 4.49 | 4.40 | 4.41 | **4.49** |
| **4E oz** | Moz | 1.3 | 8.6 | 9.9 | 1.6 | 9.3 | 10.9 | **20.8** |
| **6E oz** | Moz | 1.5 | 9.7 | 11.2 | 1.9 | 11.1 | 13.1 | **24.3** |
| **Pt oz** | Moz | 0.8 | 5.4 | 6.3 | 0.9 | 5.4 | 6.3 | **12.6** |
| **Pd oz** | Moz | 0.4 | 2.4 | 2.8 | 0.5 | 2.9 | 3.4 | **6.1** |

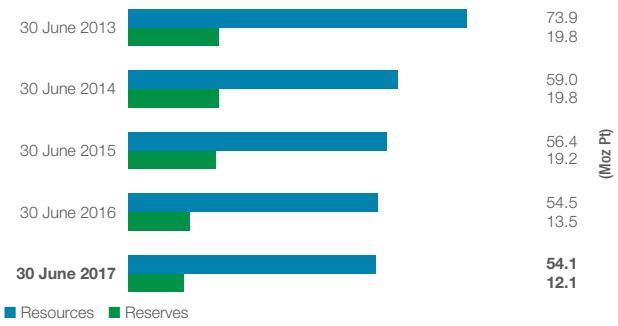
| as at 30 June 2016 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky Proved | Merensky Probable | Merensky Total | UG2 Proved | UG2 Probable | UG2 Total | Total |
| **Tonnes** | Mt | 10.3 | 71.3 | 81.6 | 17.8 | 84.4 | 102.2 | **183.8** |
| **Width** | cm | 127 | 132 | | 108 | 106 | | |
| **4E grade** | g/t | 4.03 | 4.19 | 4.17 | 3.73 | 3.76 | 3.76 | **3.94** |
| **6E grade** | g/t | 4.53 | 4.71 | 4.69 | 4.48 | 4.52 | 4.51 | **4.59** |
| **4E oz** | Moz | 1.3 | 9.6 | 10.9 | 2.1 | 10.2 | 12.3 | **23.3** |
| **6E oz** | Moz | 1.5 | 10.8 | 12.3 | 2.6 | 12.2 | 14.8 | **27.1** |
| **Pt oz** | Moz | 0.8 | 6.0 | 6.9 | 1.2 | 5.9 | 7.1 | **14.0** |

The year-on-year reconciliation of the total Impala Mineral Reserves is depicted in the accompanying maps and graphs. There has been no material change in the Mineral Reserves estimate since June 2016, other that depletion and economic tail-cutting. A combined graph of the attributable Mineral Resources and Mineral Reserves are also included showing a relative stable inventory. A summary illustration of the progression of Mineral Resources to Mineral Reserves is depicted on the next page, showing the total Mineral Resource estimates ("inclusive" style reporting); those Mineral Resources not progressed to Mineral Reserves ("exclusive" style reporting); the proportion of Mineral Resources that is progressed to Mineral Reserves and the summary Mineral Reserves as derived after modifying factors, including dilution.

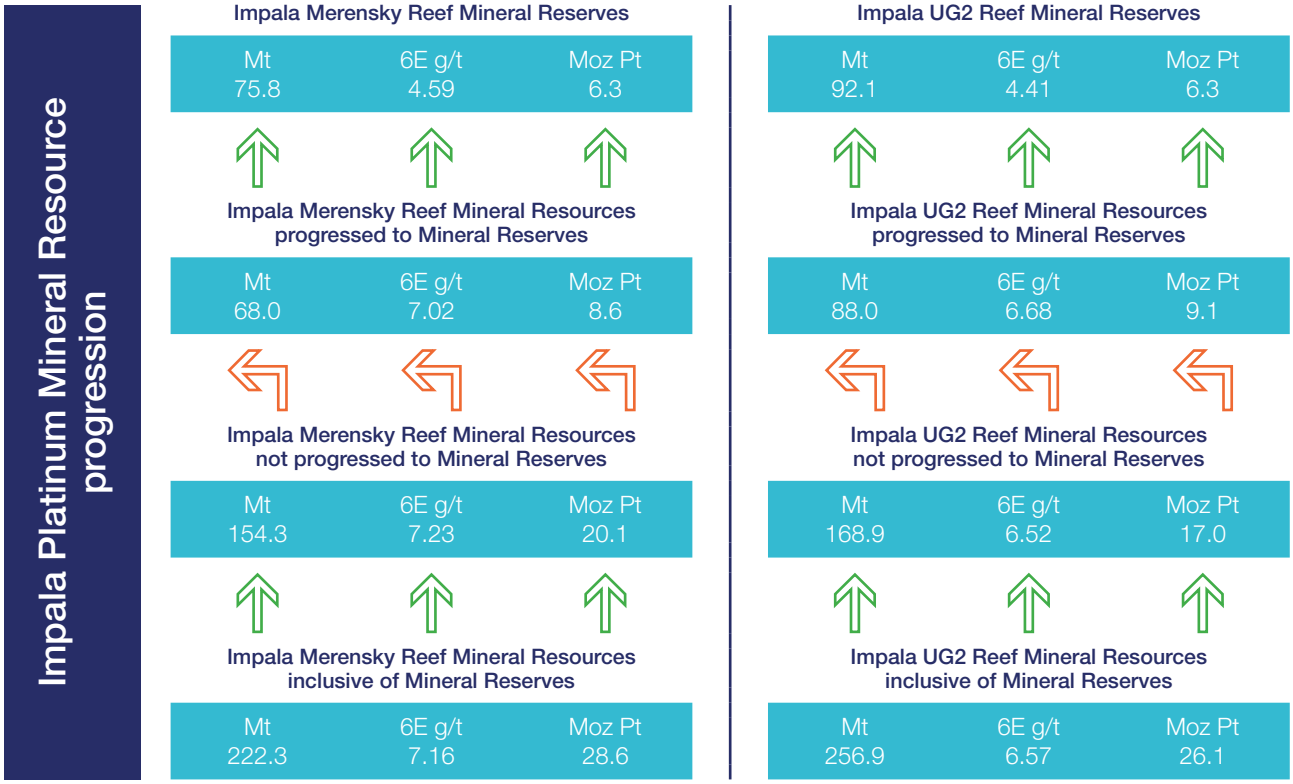
### Total Impala Mineral Reserves




### Impala attributable Mineral Resources and Mineral Reserves



# Impala




## Processing

Processing receives ore from the shafts which is allocated to either the UG2 plant, for the higher chromium grade material, or the Central Concentrator for Merensky ore. PGMs in Merensky ore is recovered at around 89% at a mass pull of 7.14% utilising 12 primary mills and three secondary units, feeding two, nine stage, tank cell flotation banks. PGMs in UG2 ore is recovered at around 79% at a mass pull of 2.22%. The PGM recovery from UG2 ore is performed utilising a more complex circuit configuration in order to reduce the amount of chromium reporting to the concentrate stream. The MF2 plant, also situated at the Central Concentrator, utilises three primary mills that can accommodate any Merensky ore spill over, as well as UG2 ore. This allows for flexibility in the ore split received from the mining operations, without significantly impacting recovery of valuable material. Tailings from both concentrators is further processed at the Tailings Scavenging plant in order to improve overall performance. UG2 ore tails are also treated at two chromitite recovery plants.

The smelter operation treats the concentrate from both the Central Concentrator, UG2 plant, as well as IRS material. The concentrate is first dried in order to reduce moisture content to below 0.5%, and is then treated through one of three electric arc furnaces to produce a copper, nickel, iron sulphide rich matte, at a mass pull of around 10%. The remaining 90% produces a low grade furnace slag. The maximum power utilisation capacity of the three furnaces is in the order of 105MW. The furnace matte is then treated in the converter operation which further reduces the tonnage by around 75%, in order to reduce the iron content to below 1%, as per refinery specification. Granulated converter matte is transported to the refinery operations in Springs utilising road infrastructure. Both furnace and converter slag are retreated at the Slag Plant utilising a flotation process.

During the smelting operation, off gasses are treated at either the acid plant to produce sulphuric acid, or the sulphacid plant which produces gypsum. While these operations do not have a direct value add, they are essential in retaining our operating licence by complying with emissions regulations.

The refineries, including both the base metal and precious metal refineries, are located in Springs, east of Johannesburg.

# Impala

## Impala top risks

The Group risk management process is described on page 14 where the top 10 Group risks are listed. In this context the top additional operations risks identified at Impala in order of priority are:

- Sustained depressed PGM basket prices
- Non-delivery of production and productivity targets
- A significant deterioration in safety performance
- Policy risk arising from change in legislation
- Capital constraints affecting project delivery
- Impact of UG2 support changes
- Employee relations climate.

## Valuation

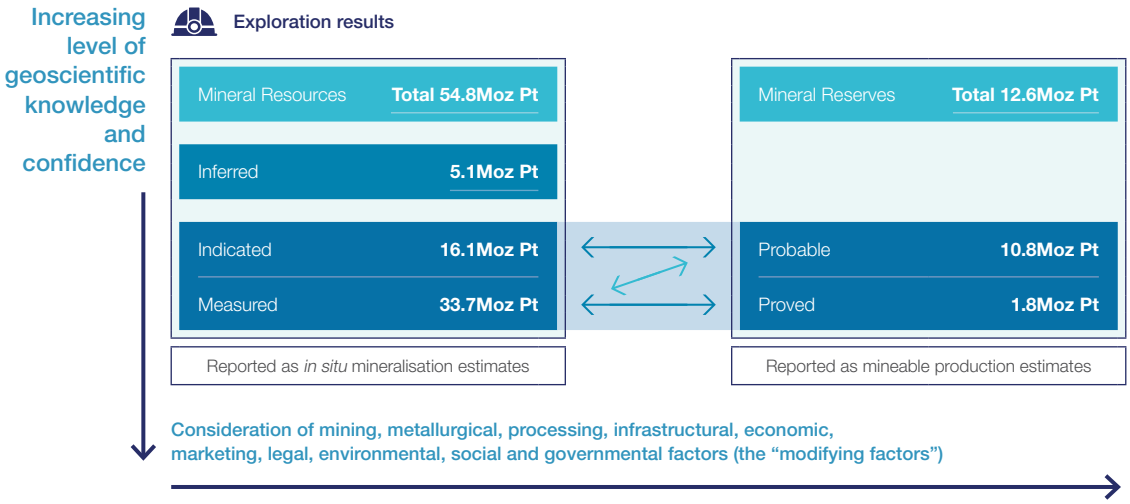
The economic viability of the Impala Mineral Reserves is tested by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price which would still render the Mineral Reserve viable. This is then tested against the internal Impala estimate of the real long-term basket price, the spot price as at 30 June 2017 and a consensus view from various financial institutions. These tests indicate that the Impala Operation requires a real long-term basket price of between R23 000 and R25 000 to be economically viable.

While the real spot basket price as at 30 June 2017 was R20 960 (US$1 620), the Impala internal long-term real basket price is R29 100 (US$2 100) and the equivalent calculated consensus price is R25 900 (US$2 000). Future investments beyond current infrastructure at Impala will at best be marginal under the price assumptions.

## Compliance

Impala has adopted the SAMREC Code for its reporting. The Lead Competent Person for the Impala Mineral Reserves is David Sharpe, a full-time employee of Impala. The Competent Person, PrSciNat SACNASP Registration No: 400018/91, has 29 years' relevant experience. The Lead Competent Person for the Impala Mineral Resources is Johannes du Plessis, also a full-time employee of Impala. The Competent Person, PrSciNat SACNASP Registration No: 4000284/07, has 16 years' relevant experience. Implats has written confirmation from the Lead Competent Persons that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended.

**Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)**



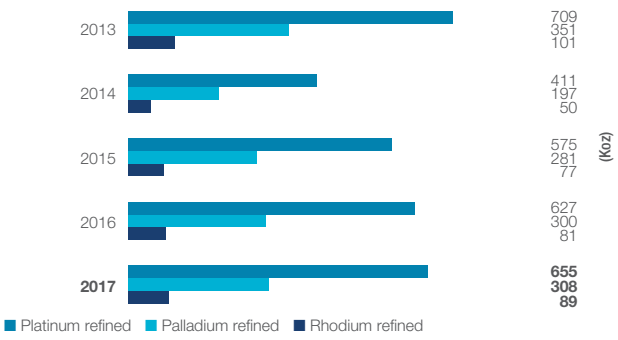
# Impala

## Key operating statistics

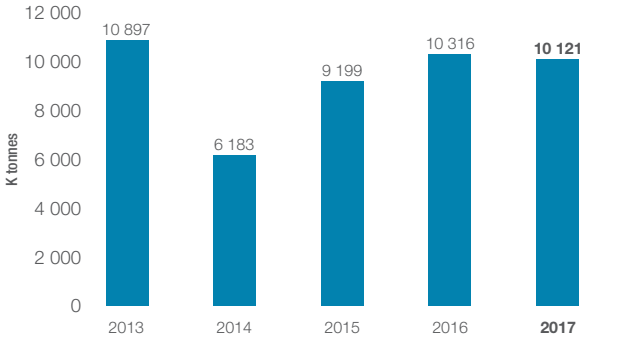
| | | FY2017 | FY2016 | FY2015 | FY2014 | FY2013 |
|---|---|---|---|---|---|---|
| **Production** | | | | | | |
| Tonnes milled ex mine* | (000t) | **10 121** | 10 316 | 9 199 | 6 183 | 10 897 |
| Head grade 6E | (g/t) | **4.06** | 4.16 | 4.19 | 4.34 | 4.32 |
| Platinum refined | (000 oz) | **655** | 627 | 575 | 411 | 709 |
| PGM refined | (000 oz) | **1 247** | 1 220 | 1 137 | 766 | 1 378 |
| **Cost of sales** | | **(17 510)** | (16 506) | (14 824) | (12 229) | (12 491) |
| On-mine operations | (Rm) | **(11 703)** | (10 600) | (10 354) | (6 616) | (8 993) |
| Processing operations | (Rm) | **(2 896)** | (2 534) | (2 335) | (1 606) | (2 295) |
| Refining operations | (Rm) | **(615)** | (571) | (794) | (615) | (735) |
| Other | (Rm) | **(2 296)** | (2 801) | (1 341) | (3 392) | (468) |
| **Total cost** | (Rm) | **15 411** | 13 879 | 13 738 | 9 057 | 12 227 |
| Per tonne milled* | (R/t) | **1 523** | 1 345 | 1 493 | 1 465 | 1 122 |
| | ($/t) | **112** | 93 | 131 | 141 | 127 |
| Per Pt oz refined | (R/oz) | **23 543** | 22 139 | 23 884 | 22 036 | 17 241 |
| | ($/oz) | **1 726** | 1 535 | 2 092 | 2 125 | 1 955 |
| **Financial ratios** | | | | | | |
| Gross margin ex mine | (%) | **(19.9)** | (13.4) | (10.9) | (18.4) | 14.4 |
| **Capital expenditure** | (Rm) | **2 472** | 2 490 | 3 047 | 2 848 | 4 411 |
| | ($m) | **181** | 173 | 267 | 275 | 500 |

** The mined tonnage and grade statistics above exclude the low-grade material from surface sources.*

### Impala production

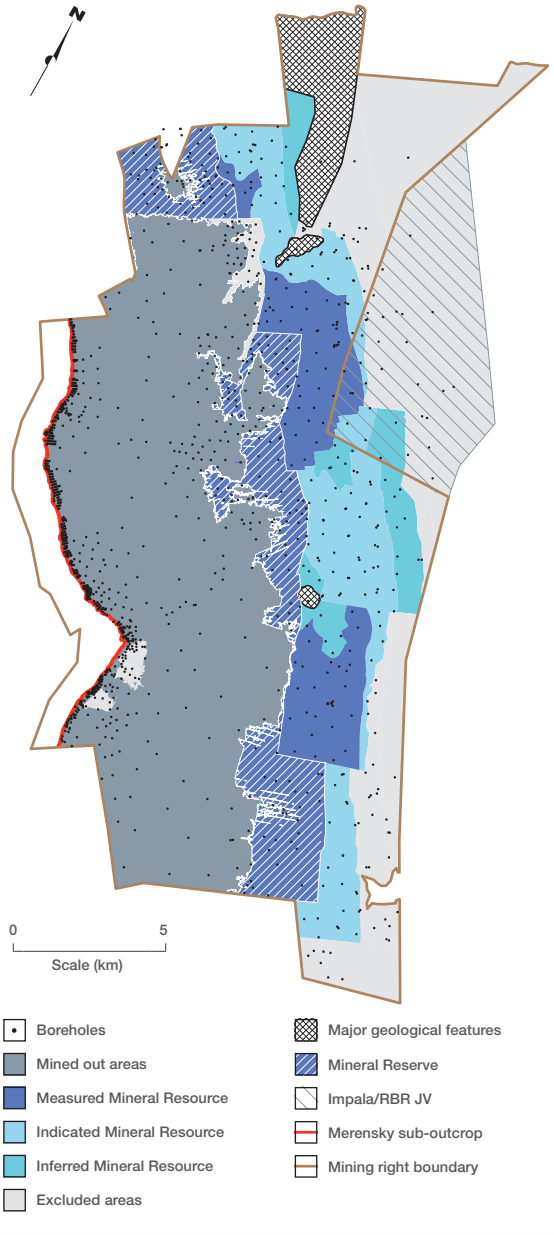



### Tonnes milled

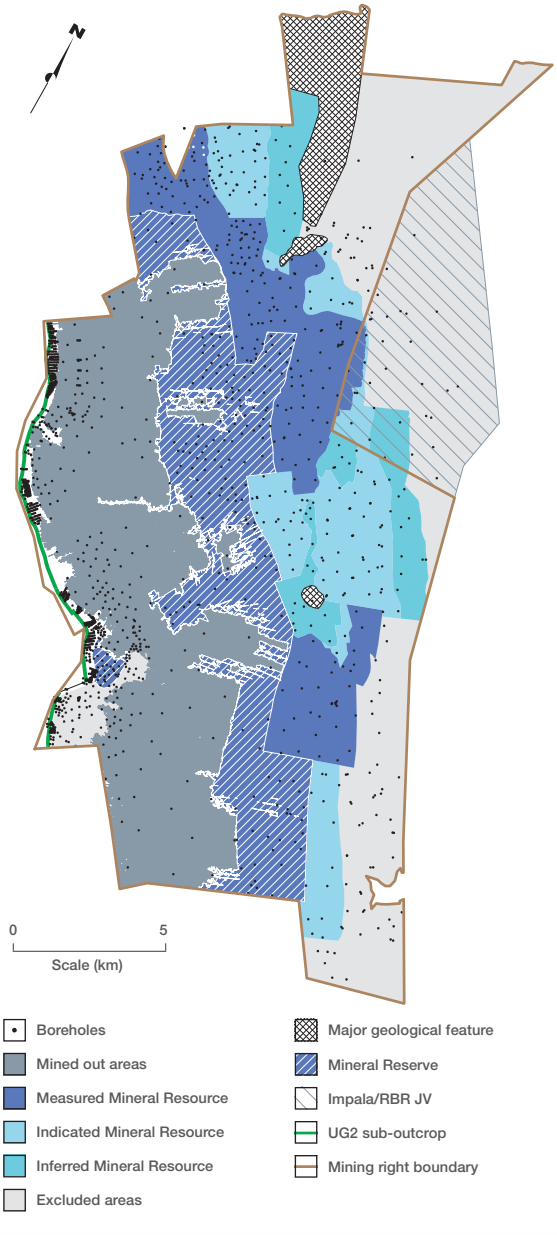


# Impala

## Impala Merensky Mineral Resources and Mineral Reserves




## Impala UG2 Mineral Resources and Mineral Reserves



# Impala

*11 Shaft, Impala*

# Marula

Platinum from this area was first recognised by renowned explorer **Hans Merensky** on the nearby farm **Maandagshoek** in 1924. In June 1998 Implats entered into an arrangement to acquire the **Winnaarshoek** property from Platexco, a Canadian-based company.

## History

The mineral rights to portions of the adjacent farms of Clapham and Forest Hill and a sub-lease to Driekop were subsequently acquired from Anglo Platinum in exchange for Hendriksplaats (now part of Modikwa Platinum Mine), thus consolidating the Marula Mine area. The exploration programme was expanded and some 750 surface boreholes have been drilled to date. The establishment and development of the mine commenced in October 2002.

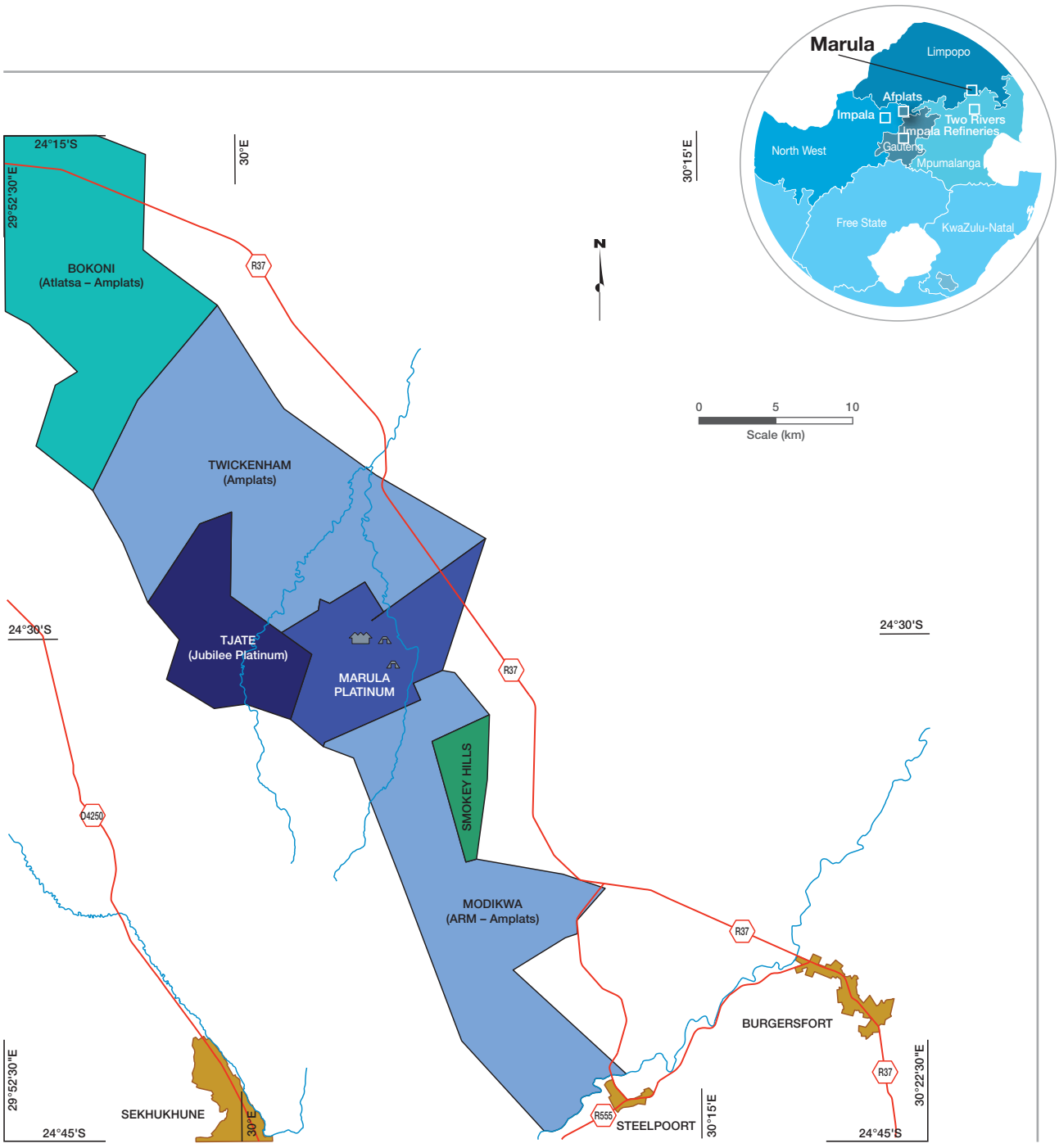
# Marula

## Location

Marula Mine is located within the Greater Tubatse Local Municipality of the Limpopo province of the Republic of South Africa, approximately 35km northwest of the town of Burgersfort, 120km southeast of Polokwane and 40km northwest of Steelpoort. The mine is accessible from a well-developed network of national and provincial tarred roads, with the closest public airport located in Polokwane.

Marula Platinum is situated in the Eastern Bushveld Complex, located south of the Anglo Platinum Twickenham Mine and north of the Anglo Platinum-ARM Modikwa Mine. The western (down-dip) boundary is shared by Jubilee Platinum and its Tjate Project.

### Regional locality map showing PGM Mineral Rights and infrastructure at Marula



# Marula

## Mineral rights

Marula holds two contiguous mining rights and a prospecting right covering 5 494ha across the farms Winnaarshoek and Clapham, and portions of the farms Driekop, Forest Hill and Hackney. Marula also has a royalty agreement with Modikwa, which allows limited mining on an area adjacent to the Driekop Shaft. These Mineral Resources and Mineral Reserves have not been reflected in the current statement as ownership still rests with Modikwa. Implats has a 73% interest in Marula with each of the three empowerment groupings (Mmakau Mining, the Marula Community Trust and Tubatse Platinum) holding a 9% interest each.

The new-order mining right was awarded for a 30-year period in 2008. In terms of the MPRDA holders of the mining rights may apply for more than one renewal period of a maximum of 30 years each as per the supporting mining work programme, 60 working days before the relevant expiry date.

## Infrastructure

The region is well developed, partly due to other mining activities in the vicinity. The R37 tarred road from Burgersfort to Polokwane passes through the area, while a secondary tarred road, built by Marula, links the R37 to the main office and other infrastructure at Marula. The existing mines and villages are supplied with electricity by Eskom.

Marula has an adequate and firm electricity supply and distribution network. The site is supplied by two independent 132kV Eskom power lines. Two 40MVA transformers (one operating and one on standby) convert the voltage to 33kV for surface and underground distribution. Water is provided through the Lebalelo Water Scheme from which Marula has an allocation of 13.8Ml per day, which is more than adequate for planned production levels. Mining infrastructure includes two decline shafts, offices, stores, a concentrator plant, a chromitite recovery plant, a tailings storage facility and overland ore conveyance.

## Environmental

Marula obtained the re-certification of ISO 14001 in September 2016. In line with our environmental management system expectations, all areas are required to identify and report on environmental incidents. Systems are in place to investigate and determine the direct and root causes of high-severity incidents and to address and close out these incidents. The preliminary design for an additional tailings storage facility is currently under way. An environmental management plan (EMP) for the new facility was approved in 2008. Confirmation that this EMP is valid was obtained from the DMR. Further licensing requirements will be done during the detailed design phase of the project.

*UG2 ore on conveyor at the Driekop decline, Marula*

# Marula

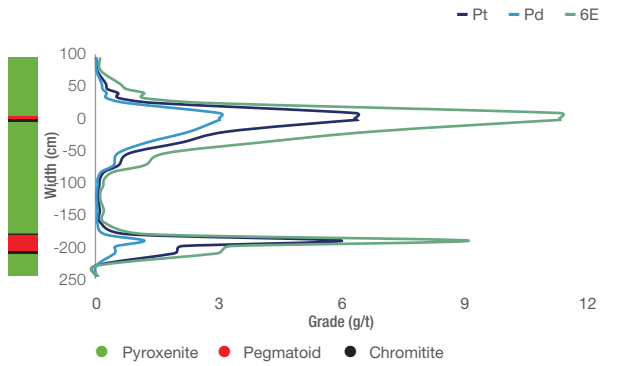
## Geology

The geological succession is illustrated in the generalised stratigraphic column on page 66. The Merensky and UG2 Reefs are separated by a sequence of mostly anorthositic and noritic layered units of some 400m in combined thickness. Both the Merensky and UG2 Reefs are present but only the UG2 is currently exploited. The geological succession is broadly similar to that of the western limb. The UG2 Reef is defined as a main chromitite layer, with most of the mineralisation confined to this unit, followed by a poorly-mineralised pegmatoidal footwall. The Merensky Reef is the upper portion of a pyroxenite layer, with a chromitite stringer close to the hangingwall contact. Mineralisation peaks over the chromitite stringer and decreases into the hangingwall and footwall. The average 6E metal ratios show the distinct differences between the Merensky and UG2 Reefs, in particular the high proportion of palladium associated with the UG2 at Marula and also the relative high proportion of rhodium in the UG2 Reef.

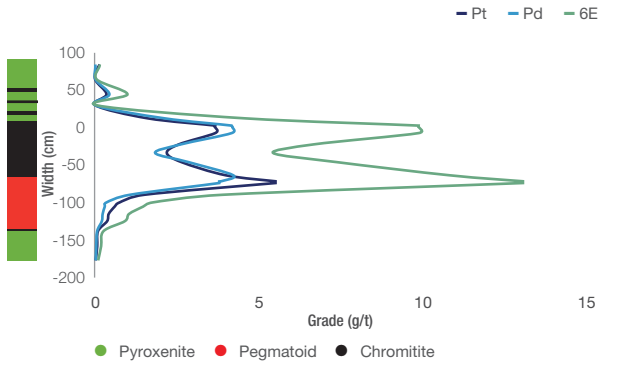
Both mineralised horizons sub-outcrop on the Marula mining rights area and dip in a west-southwest direction at 12° to 14°. The reefs are relatively undisturbed by faults and dykes with one major dyke traversing the mining area. Potholes represent the majority of the geological losses encountered underground, while a small dunite pipe also disrupts the reef horizons. These geological features are accounted for in the Mineral Resource and Mineral Reserve Statements as geological losses.

*Coreyard at Marula*

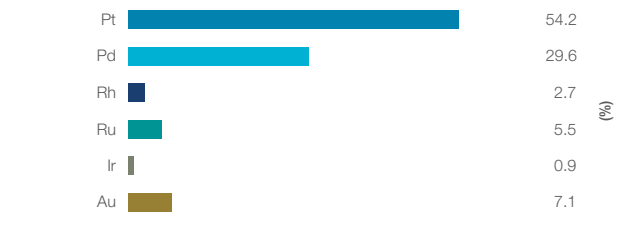
### Marula – Merensky




### Marula – UG2

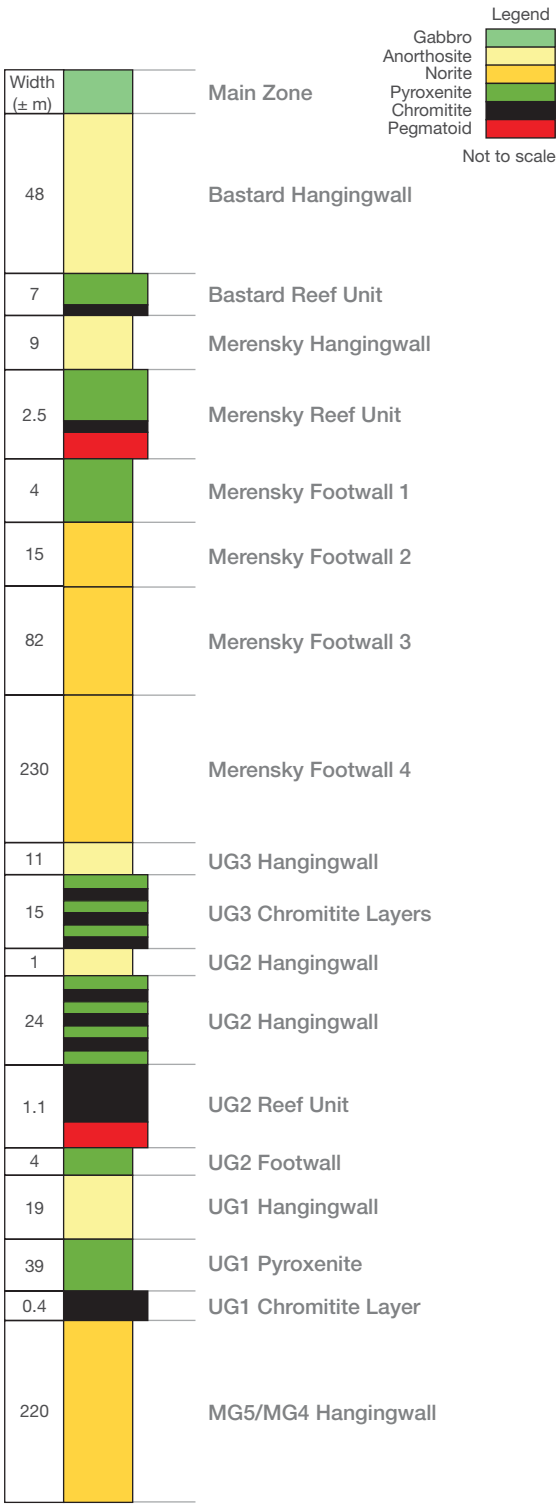



### Marula Merensky 6E metal ratio




### Marula UG2 6E metal ratio

# Marula




GENERALISED GEOLOGICAL SUCCESSION OF THE UPPER PORTION OF THE CRITICAL ZONE: MARULA

## Exploration

Exploration activities which led to the discovery of PGEs at Marula Mine started in the 1920s following the recognition of PGEs by Hans Merensky on the nearby Maandagshoek farm (now Modikwa Mine). Follow-up exploration in the 1960s and 1980s by Anglo American Platinum Limited (Anglo Platinum) entailed exploration drilling targeting both the Merensky and the UG2 Reefs. There is limited data relating to these historical explorations initiatives.

Several exploration techniques have been employed at Marula by historical explorers and Implats, with the most notable being surface geological mapping, aeromagnetic surveys and drilling. Core drilling is the main drilling technique employed although limited reverse circulation drilling was also undertaken to refine the structural model in areas of potential open-pit mining. Ongoing surface drilling is typically infill work to supplement a broader grid of 500m spacing completed during feasibility stages. Such work is mostly targeted to assist with detailed structural interpretations.

Underground geotechnical core-recovering drilling activities are routinely being undertaken at Marula. This formed part of a proactive safety strategy to detect flammable gas, gas pockets, water-bearing features, possible geological anomalies and related phenomena ahead of current mining operations. The work conducted in the past year is summarised in the exploration overview section of this report.

## Mineral Resource estimation and reconciliation

The statement on page 67 reflects total estimates for Marula as at 30 June 2017. The corresponding estimated attributable Mineral Resources are summarised on page 32. Note that Mineral Resources are quoted inclusive of Mineral Reserves. Estimated geological losses have been accounted for in the Mineral Resource estimate. The Hackney area was excluded from this statement because there is currently no realistic reasonable prospect of eventual economic extraction. Changes in the UG2 and Merensky Mineral Resource estimates since last year reflect an updated estimation using limited additional data. No Inferred Mineral Resources have been converted into Mineral Reserves.

The Mineral Resource estimate for the UG2 Reef is shown at a minimum mining width. In previous years both the channel estimates and the minimum mining width were reported; the practice to only reflect the minimum mining width is intended to avoid confusion. The Mineral Resource estimates are reflected in both 4E and 6E formats. Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature and the results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

# Marula

The average nickel and copper grades based on exploration samples are 0.20% Ni and 0.11% Cu for the Merensky Reef channel. The average nickel and copper grades based on exploration samples are 0.05% Ni and 0.02% Cu for the UG2 Reef channel.

The estimate has been conducted using the Isatis™ software. A multi-pass search was used for the estimation and capping of extreme values was applied for UG2 Reef data. Estimated losses have been accounted for in the Mineral Resource calculation varying from 18% to 26%, using the geological model, constructed in CADSmine™ software as the basis.

The Mineral Resource classification is based on a Group standard practice that considers the quality of the data, the continuity of the reef, if a seismic survey covers the area or not, the data spacing, and the geostatistical parameters.

## Marula Mineral Resources – 100% (inclusive reporting)

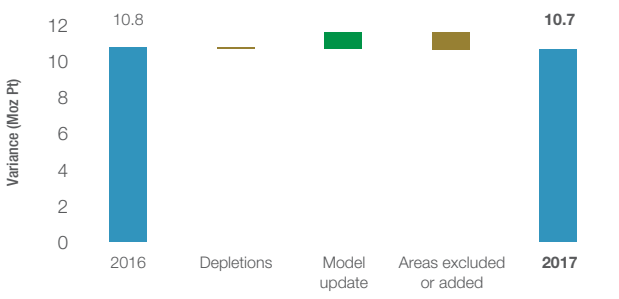
as at 30 June 2017

| as at 30 June 2017 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | | UG2 | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 34.3 | 7.6 | 5.2 | 47.0 | 51.2 | 22.4 | 6.4 | 80.0 | **127.0** |
| Width | cm | 100 | 100 | 100 | | 96 | 102 | 104 | | |
| 4E grade | g/t | 4.26 | 4.20 | 3.82 | 4.21 | 6.13 | 6.21 | 6.29 | 6.17 | **5.44** |
| 6E grade | g/t | 4.56 | 4.50 | 4.10 | 4.50 | 7.16 | 7.25 | 7.34 | 7.20 | **6.20** |
| Ni | % | 0.20 | 0.19 | 0.19 | 0.20 | 0.04 | 0.05 | 0.05 | 0.05 | **0.10** |
| Cu | % | 0.11 | 0.11 | 0.10 | 0.11 | 0.02 | 0.02 | 0.02 | 0.02 | **0.05** |
| 4E oz | Moz | 4.7 | 1.0 | 0.6 | 6.4 | 10.1 | 4.5 | 1.3 | 15.9 | **22.2** |
| 6E oz | Moz | 5.0 | 1.1 | 0.7 | 6.8 | 11.8 | 5.2 | 1.5 | 18.5 | **25.3** |
| Pt oz | Moz | 2.7 | 0.6 | 0.4 | 3.7 | 4.5 | 2.0 | 0.6 | 7.0 | **10.7** |
| Pd oz | Moz | 1.5 | 0.3 | 0.2 | 2.0 | 4.6 | 2.0 | 0.6 | 7.2 | **9.2** |

| as at 30 June 2016 | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | | UG2 | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 34.3 | 7.9 | 9.7 | 51.9 | 33.3 | 13.6 | 7.7 | 54.6 | **106.5** |
| Width | cm | 100 | 100 | 100 | | 57 | 62 | 60 | | |
| 4E grade | g/t | 4.26 | 4.24 | 4.17 | 4.24 | 8.65 | 8.89 | 9.07 | 8.77 | **6.56** |
| 6E grade | g/t | 4.56 | 4.54 | 4.46 | 4.54 | 10.17 | 10.45 | 10.67 | 10.31 | **7.50** |
| Ni | % | 0.20 | 0.19 | 0.21 | 0.20 | 0.05 | 0.06 | 0.06 | 0.06 | **0.13** |
| Cu | % | 0.11 | 0.11 | 0.12 | 0.11 | 0.02 | 0.03 | 0.03 | 0.02 | **0.07** |
| 4E oz | Moz | 4.7 | 1.1 | 1.3 | 7.1 | 9.3 | 3.9 | 2.3 | 15.4 | **22.5** |
| 6E oz | Moz | 5.0 | 1.2 | 1.4 | 7.6 | 10.9 | 4.6 | 2.7 | 18.1 | **25.7** |
| Pt oz | Moz | 2.7 | 0.6 | 0.7 | 4.1 | 4.0 | 1.7 | 1.0 | 6.7 | **10.8** |

The year-on-year reconciliation of the Marula Mineral Resource estimate shows variations due to the exclusion of Hackney, the model update that is based on a minimum width and also mining depletion. In June 2016 two styles of reporting were shown: the main chromitite channel width and a comparative minimum mining width Mineral Resource estimate. The current format only reflects a minimum width as this provides more clarity.

### Total Marula Mineral Resources



# Marula

## Modifying factors

Key modifying factors, such as overbreak, underbreak, off-reef mining, development dimensions, sweepings and mine call factors, are applied to the mining area (centare profile) to generate tonnage and grade profiles. The modifying factors used to convert a Mineral Resource to a Mineral Reserve are derived from historical performance while taking future anticipated conditions into account. Key factors are tabulated below.

### Key factors and assumptions

| Merensky Reef | Factors |
|---|---|
| Geological losses | 20 – 25% |
| Mineral Resource area | 15 million ca's |
| Relative density | 3.2 – 3.3 |
| Channel width | 100cm |

**Long-term price assumptions in today's money (supporting Mineral Reserve estimates): see pages 5 and 30 for the Implats price assumptions**

| UG2 Reef | Factors |
|---|---|
| Geological losses | 20 – 25% |
| Mineral Resource area | 21 million ca's |
| Pillar factors | 12% |
| Resource dilution | 9 – 12% |
| Mine call factor | 96 – 98% |
| Relative density | 3.8 – 3.9 |
| Channel width | 98cm |
| Stoping width | 133cm |
| Concentrator recoveries | 87 – 88% |

| | 6E metal ratio (%) | |
|---|---|---|
| | Merensky | UG2 |
| Platinum | 54.2% | 37.8% |
| Palladium | 29.6% | 38.8% |
| Rhodium | 2.7% | 8.0% |
| Ruthenium | 5.5% | 10.9% |
| Iridium | 0.9% | 3.5% |
| Gold | 7.1% | 1.0% |

| | Implats interest | Mining Right (ha) | Prospecting right (ha) |
|---|---|---|---|
| Marula | 73% | 5 494 | 223 |

*Makgomo chrome recovery plant at Marula*

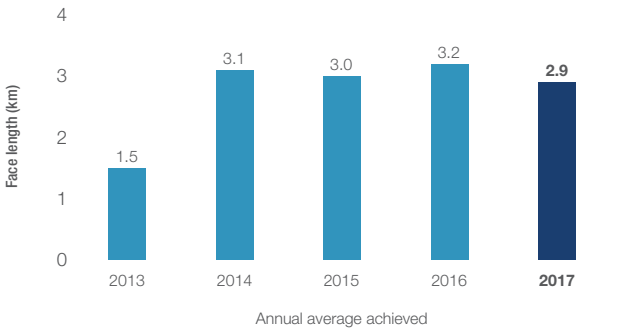
# Marula

## Mining flexibility at Marula

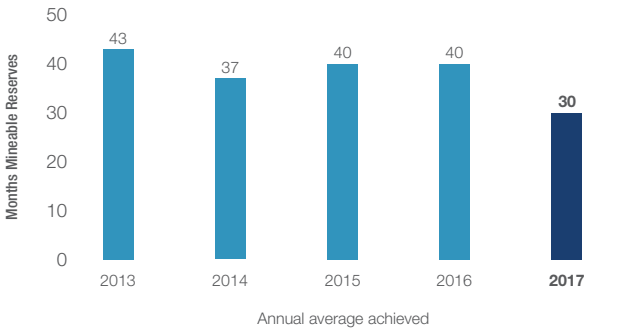
Similar to Impala, creating and maintaining mining flexibility is a key business imperative to ensure effective, safe and productive mining. One of the mining flexibility measures at conventional stoping sections is the mineable face length. These are stoping faces that can immediately be exploited without any further development or equipping. Progress of such flexibility is managed in detail. The target is to have a flexibility of 1.5, in other words, to have three mineable panels for every two stoping teams. Progress has been made in the past four years with the total mineable face length at Marula having increased from 1.5km in 2013 to some 3.2km in 2016. There has been a regression in the past year in the total mineable face length to 2.9km. The negative impact can be ascribed to the economic assessment of certain unprofitable areas, in particular the previous Clapham Hybrid section. On-reef development targets were not achieved in FY17, this also impacted the overall mineable face length.

The second measure of mining flexibility relates to the "Mineable Reserves", which is defined as that part of the orebody that has been accessed by main grid development, in particular that areas where raise/winze holings have been effected (this is a local operational term and should not be confused with the SAMREC terminology). The "Mineable Reserves" are measured as (a) the total reef area exposed by development and measured in centares, and (b) a traditional high-level ratio of "months Mineable Reserves". The term "months Mineable Reserves" is merely the total reef area divided by the average monthly area planned (centares per month). The graph below depicts a relative healthy overall status with a slight increase in the overall "Mineable Reserves" during the past five years, also an achieved factor of more than 30 "months Mineable Reserves". This relates well against a general industry norm of 24 months "Mineable Reserves". The decrease in the past year relates to the closure of the Clapham Hybrid section.

### Mineable face length at Marula




### Marula – Months Mineable Reserves




*UG2 plant at Marula*

# Marula

## Mining methods and mine planning

Marula Mine has two decline shaft systems. Driekop Shaft is exploiting the UG2 Reef by means of a hybrid mining method, while at Clapham Shaft, both a hybrid and conventional mining method are being used to exploit the UG2 Reef. For the two hybrid sections, all main development is done on-reef and the stoping is carried out through conventional single-sided breast mining from a centre gully. Panel face lengths are approximately 16m to 24m, with panels being separated by 6m x 4m grid pillars with 2m ventilation holings. The stoping width averages 1.33m. For the conventional operation, the footwall drives are developed on strike approximately 25m below the reef horizon with cross-cut breakaways about 220m apart. This development is undertaken with drill rigs and dump trucks. Stope face drilling takes place with hand-held pneumatic rock drills with air legs.

Mine design and scheduling of the operational shafts is carried out using CADSmine™ software. Geological models and ore blocks are updated and validated using G-Blocks and boundaries in the MRM information system. Grade block models are developed using Isatis™ software. The planning process starts with the compilation of the LoM plan (August to October) followed by a detailed two-year budget plan (February to April). The spread of Mineral Reserves over the three mining sections is depicted below. The majority of the Mineral Reserves (67%) are located in the Clapham Decline section.

The LoM I encompasses the UG2 Reef Clapham Conventional area up to 5 Level, Driekop Hybrid and Driekop Extension areas. Marula LoM indicates that production will be slightly below two million tonnes per year for the next two years. This is due to the rightsizing of the operation whereby the Hybrid section was stopped and all the Driekop Shaft's loss-making half levels are closed. There are various options to optimise LoM II and III, these are subjects of studies going forward. The comparison between the Mineral Resource Statement and the 20-year LoM profile clearly illustrates Marula's potential to expand operations in future if economically viable. Note that the indicative LoM profile is based on a range of assumptions, which could change in future.

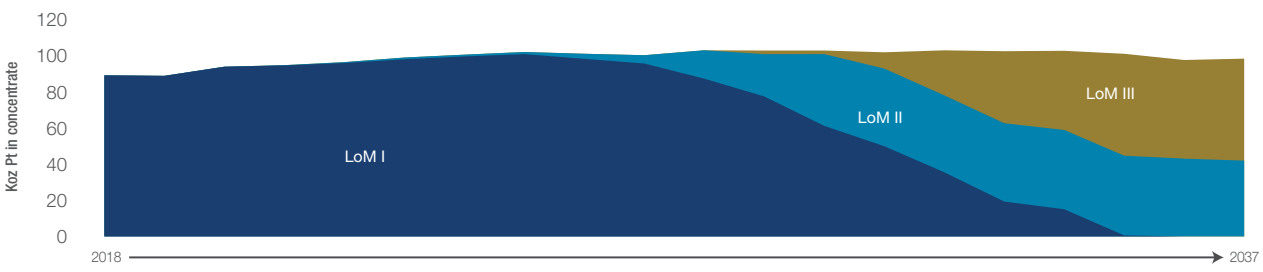
## Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimate for Marula as at 30 June 2017 is tabulated on page 71. The corresponding estimated attributable Mineral Reserves are summarised on page 35. Mineral Reserves quoted reflect the stoping width. The Mineral Reserves quoted reflect the grade delivered to the mill rather than the *in situ* channel grade quoted in respect of the Mineral Resources. The modifying factors used in the UG2 Mineral Reserve estimate are based on the mine plan, which envisages hybrid and conventional breast mining operations. No Inferred Mineral Resources have been converted into Mineral Reserves. An economic profitability test was conducted at each shaft, in particular also to conduct so-called tail-cutting at the end of a shaft's life.

The Mineral Reserves are reflected in both 4E and 6E formats. Rounding of numbers may result in minor computational discrepancies. The conversion and classification of Mineral Reserves at Marula is informed by:

- Feasible mine plan and project studies, board approval and available funding
- Economic testing at given market conditions (price deck)
- Measured Mineral Resources is classified as Proved and Probable Mineral Reserves if the mine plan passed economic testing and is approved for funding
- Proved Mineral Reserves are those areas where the main development has been completed and a considerable amount of the geological losses have been discounted
- No Inferred Mineral Resources are converted to the Mineral Reserve category.

**Marula 20-year Pt ounce profile**



# Marula

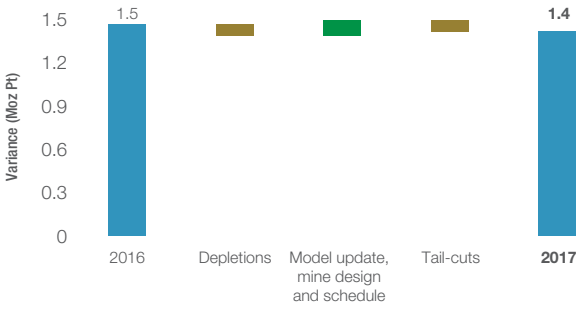
## Marula Mineral Reserves – 100%
as at 30 June 2017

| as at 30 June 2017 | | | | |
|---|---|---|---|---|
| **Orebody category** | | **Proved** | **UG2 Probable** | **Total** |
| **Tonnes** | Mt | 4.3 | 20.8 | **25.1** |
| **Width** | cm | 134 | 132 | |
| **4E grade** | g/t | 4.13 | 3.95 | **3.98** |
| **6E grade** | g/t | 4.82 | 4.62 | **4.65** |
| **4E oz** | Moz | 0.6 | 2.6 | **3.2** |
| **6E oz** | Moz | 0.7 | 3.1 | **3.8** |
| **Pt oz** | Moz | 0.3 | 1.2 | **1.4** |
| **Pd oz** | Moz | 0.3 | 1.2 | **1.5** |

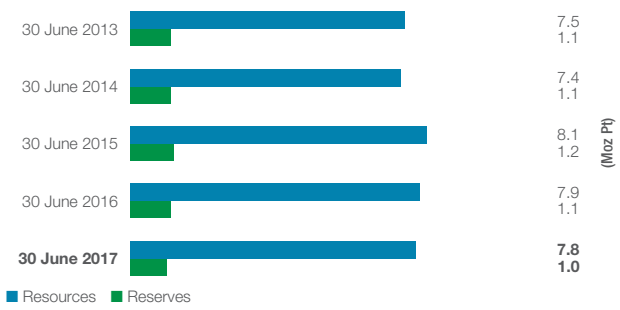
| as at 30 June 2016 | | | | |
|---|---|---|---|---|
| **Orebody category** | | **Proved** | **UG2 Probable** | **Total** |
| **Tonnes** | Mt | 4.2 | 22.2 | **26.4** |
| **Width** | cm | 133 | 132 | |
| **4E grade** | g/t | 4.18 | 3.93 | **3.97** |
| **6E grade** | g/t | 4.91 | 4.62 | **4.67** |
| **4E oz** | Moz | 0.6 | 2.8 | **3.4** |
| **6E oz** | Moz | 0.7 | 3.3 | **4.0** |
| **Pt oz** | Moz | 0.2 | 1.2 | **1.5** |

There is no material change in the Mineral Reserve estimate when compared with the June 2016 statement. The variances can be attributed to normal mining depletions, local geological impact and updated mine design in selected areas as well as an economic tail-cut.

### Total Marula Mineral Reserves




### Marula attributable Mineral Resources and Mineral Reserves




*Underground dip conveyor*

# Marula

The Marula Mineral Resource progression is illustrated below, showing among others, a summary of the total Mineral Resource ("inclusive" of Mineral Reserves); the part of the Mineral Resource that is not progressed to a Mineral Reserve ("exclusive" style reporting); the part of the Mineral Resource that is progressed to Mineral Reserves and also the Mineral Reserves.

**Marula Platinum Mineral Resource progression**

| | Marula Merensky Reef Mineral Reserves | | | Marula UG2 Reef Mineral Reserves | | |
|---|---|---|---|---|---|---|
| | Mt | 6E g/t | Moz Pt | Mt | 6E g/t | Moz Pt |
| | none | none | none | 25.1 | 4.65 | 1.4 |
| ↑ | Marula Merensky Reef Mineral Resources progressed to Mineral Reserves | | | Marula UG2 Reef Mineral Resources progressed to Mineral Reserves | | |
| | none | none | none | 20.8 | 7.00 | 1.8 |
| ↖ | Marula Merensky Reef Mineral Resources not progressed to Mineral Reserves | | | Marula UG2 Reef Mineral Resources not progressed to Mineral Reserves | | |
| | 47.0 | 4.50 | 3.7 | 59.2 | 7.27 | 5.2 |
| ↑ | Marula Merensky Reef Mineral Resources inclusive of Mineral Reserves | | | Marula UG2 Reef Mineral Resources inclusive of Mineral Reserves | | |
| | 47.0 | 4.50 | 3.7 | 80.0 | 7.20 | 7.0 |

The distribution of the Mineral Reserves is depicted in the accompanying graph. It is clear that a significant proportion of the Mineral Reserves are located in the Clapham Shaft.

**Marula Mineral Reserve distribution**


## Processing

Marula has a concentrator plant where initial processing is conducted. Concentrate is transported by road to Impala's Mineral Processes in Rustenburg in terms of a LoM offtake agreement with IRS.

## Marula top risks

The Group risk management process is briefly described on page 14, where the top 10 Group risks are listed. In this context the top additional risks identified at Marula are:

- Sustained depressed PGM basket prices
- Disruption of operations due to community unrest
- Policy risk arising from change in legislation
- Inability to maintain a social licence to operate
- The security of supply of water.

# Marula

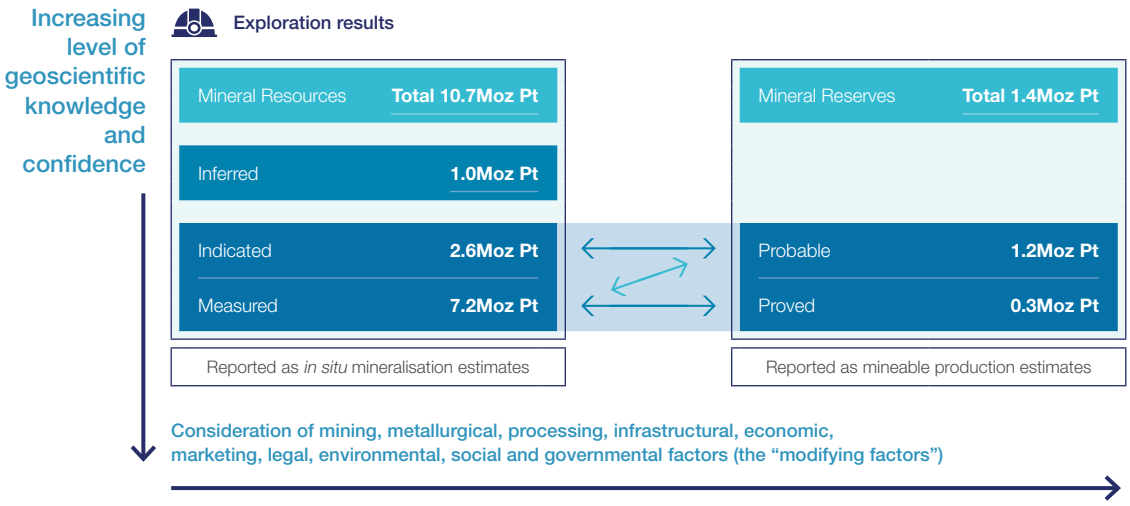
## Valuation

The economic viability of the Marula Mineral Reserves is tested by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. This is then tested against the internal Marula estimate of the real long-term basket price, the spot price as at 30 June 2017 and a consensus view from various financial institutions. These tests indicate that the Marula operation requires a real long-term basket price of between R26 000 and R28 000 to be economically viable. While the real spot basket price as at 30 June 2017 was R26 740 (US$2 070), the Marula internal long-term real basket price is R36 100 (US$2 600) and the equivalent calculated consensus price is R32 160 (US$2 480).

## Compliance

Marula has adopted the SAMREC Code for its reporting. The Lead Competent Person for Marula's Mineral Resources and Mineral Reserves is Sifiso Mthethwa, full-time employee of Marula. The Competent Person, PrSciNat SACNASP Registration No: 400163/13, has 14 years' relevant experience. Implats has written confirmation from the Lead Competent Person that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements, and that it may be published in the form, format and context in which it was intended.

**Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)**

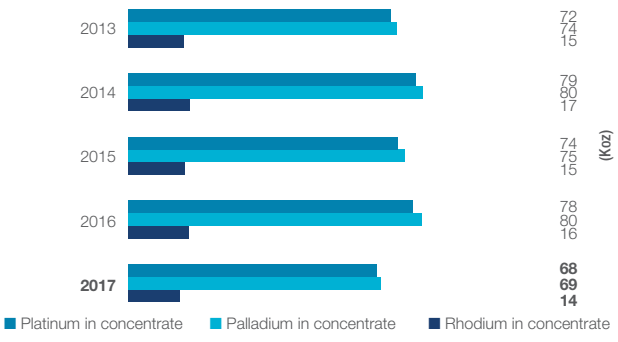


# Marula

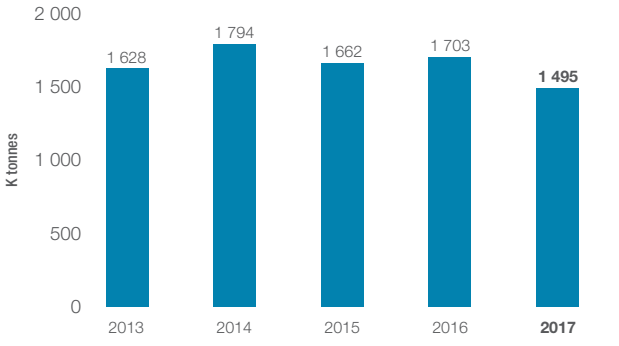
## Key operating statistics

| | | FY2017 | FY2016 | FY2015 | FY2014 | FY2013 |
|---|---|---|---|---|---|---|
| **Production** | | | | | | |
| Tonnes milled ex mine | (000t) | **1 495** | 1 703 | 1 662 | 1 794 | 1 628 |
| Head grade 6E | (g/t) | **4.26** | 4.25 | 4.19 | 4.19 | 4.19 |
| Platinum in concentrate | (000 oz) | **67.9** | 77.7 | 73.6 | 78.5 | 71.7 |
| PGM in concentrate | (000 oz) | **177.6** | 204.6 | 193.3 | 206.4 | 188.3 |
| **Cost of sales** | (Rm) | **(2 202)** | (2 076) | (1 856) | (1 803) | (1 620) |
| On-mine operations | (Rm) | **(1 810)** | (1 669) | (1 469) | (1 371) | (1 249) |
| Concentrating operations | (Rm) | **(212)** | (206) | (193) | (188) | (161) |
| Other | (Rm) | **(180)** | (201) | (194) | (244) | (210) |
| **Total cost** | (Rm) | **2 022** | 1 875 | 1 662 | 1 559 | 1 410 |
| Per tonne milled | (R/t) | **1 353** | 1 101 | 1 000 | 869 | 866 |
| | ($/t) | **99** | 76 | 88 | 84 | 98 |
| Per Pt oz in concentrate | (R/oz) | **29 779** | 24 131 | 22 582 | 19 860 | 19 665 |
| | ($/oz) | **2 184** | 1 673 | 1 978 | 1 915 | 2 230 |
| **Financial ratios** | | | | | | |
| Gross margin ex mine | (%) | **(36.3)** | (23.7) | (13.4) | (0.7) | (15.4) |
| **Capital expenditure** | (Rm) | **113** | 89 | 145 | 161 | 127 |
| | ($m) | **8** | 6 | 13 | 16 | 14 |

### Marula production

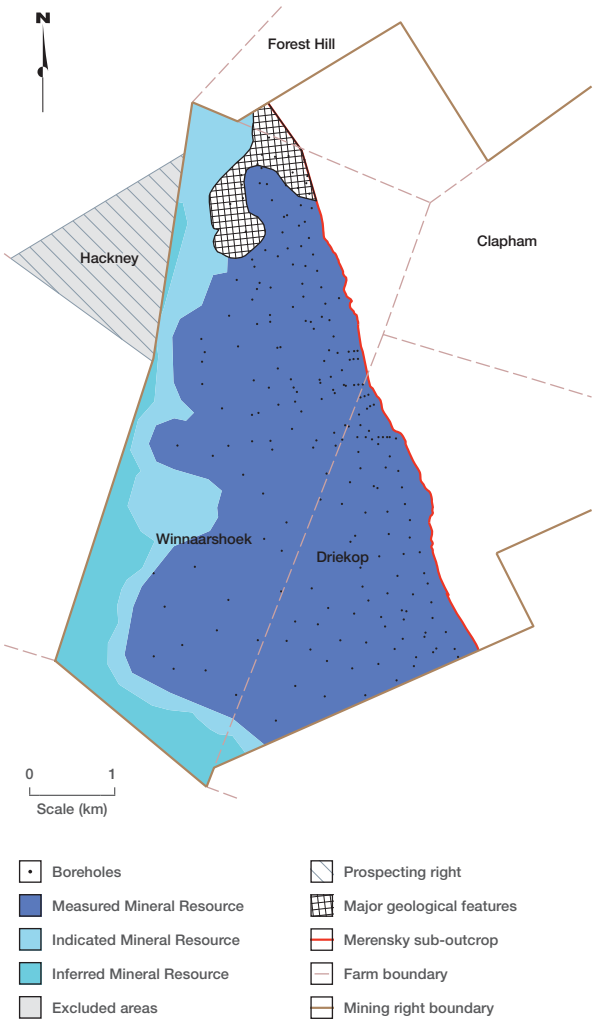



### Tonnes milled

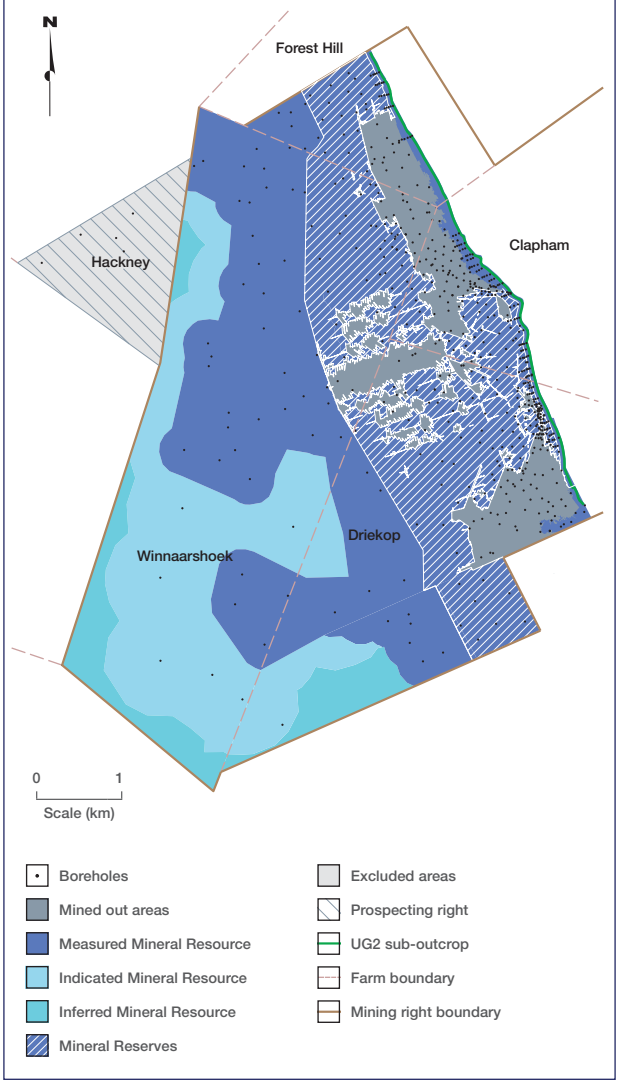


# Marula

## Marula Merensky Mineral Resources




## Marula UG2 Mineral Resources and Mineral Reserves

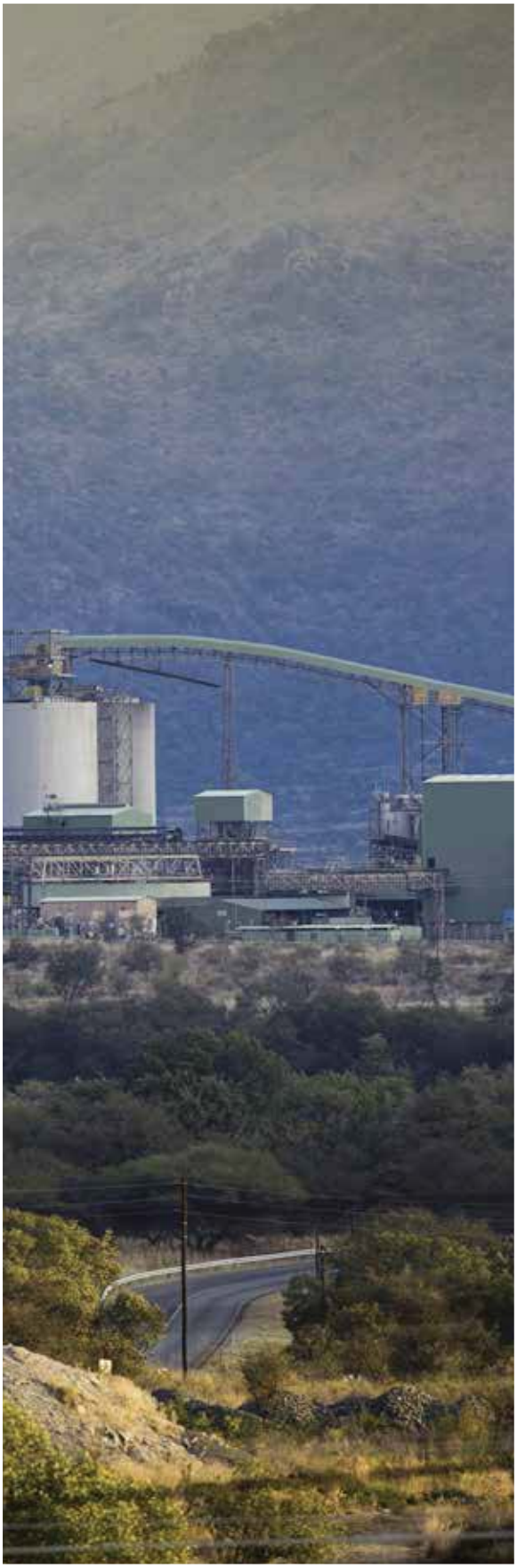


# Two Rivers

During 2001, **Assmang** elected to dispose of its platinum interests at the Dwarsrivier Chrome Mine. Two Rivers, the incorporated joint venture between Avmin and Implats, **secured the platinum rights** in December 2001.

## History

Subsequent corporate activity involving Avmin, African Rainbow Minerals (ARM) and Harmony resulted in the transfer of Avmin's share in Two Rivers to a new, empowered platinum entity, ARM Platinum, a division of ARM. The joint venture partners began development of the Two Rivers project in June 2005. The concentrator plant was commissioned in 2006 and in 2008 the mine successfully made the transition from a project to a mechanised operation.

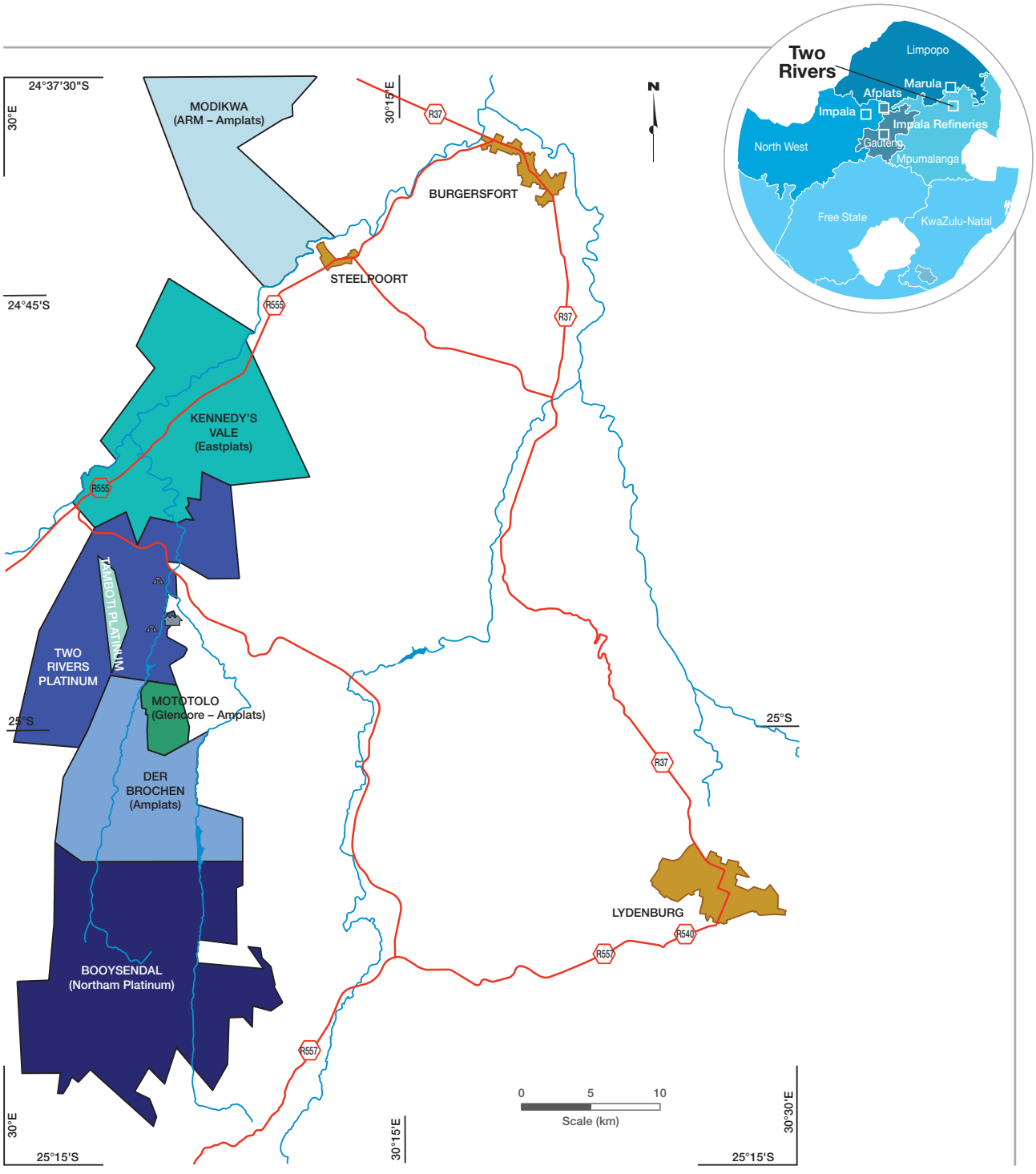


# Two Rivers

## Location

Two Rivers Platinum Mine is located within the southern sector of the Eastern Limb of the Bushveld Complex. The mine is located on the farm Dwarsrivier 372KT and extends to portions of the farms Kalkfontein 367KT and Tweefontein 360KT and the farm Buffelshoek 368KT. The mine is situated at longitude 30°07'E and latitude 24°59'S, approximately 30 kilometres from Steelpoort and 60 kilometres from Lydenburg, Mpumalanga province, South Africa. Two Rivers Platinum Mine is neighboured by Mototolo Platinum Mine (Glencore/Amplats) and Dwarsrivier, Tweefontein and Thorncliff chromite mines.

### Regional locality map showing PGM mineral rights and infrastructure at Two Rivers



# Two Rivers

## Mineral rights

The operation is managed by ARM and Implats has a 49% stake in the joint venture. Two Rivers was granted a new-order mining right in 2013 over 2 140ha on the western portion of the farm Dwarsrivier. The mining rights were awarded for a 25-year period at which time the MPRDA allows for an extension. In 2015, portions 4, 5 and 6 of the adjoining farm, Kalkfontein, as well as portions of the farm Tweefontein held by Impala, were incorporated into the Two Rivers mining right. An agreement was also reached for the remaining Implats-owned mineral rights on portions of the farm Kalkfontein and the farm Buffelshoek in exchange for a royalty payment.

A further agreement between ARM and Implats was concluded to incorporate the mineral rights held by Tamboti Platinum (Pty) Limited, which was acquired by ARM and comprises the remaining extent of the farm Kalkfontein, into the Two Rivers mining area. This will result in a decrease of the Implats shareholding from 49% to 46%. This agreement is awaiting approval of the Section 11 and 102 mineral rights application.

## Infrastructure

The tarred access road constructed by Two Rivers to the mine is in a good condition and well maintained. The nearest railway station at Steelpoort is 28km from the mine.

Two Rivers has a Water Use Licence (WUL) to obtain its water from the Groot and Klein Dwars Rivers and from underground dewatering. The annual WUL (January – December) allocation is 2 926Ml. Electricity is obtained from Eskom via one of two 40MVA transformers at the Uchoba sub-station, which are fed from a 132kV line from the Merensky sub-station.

Mining infrastructure includes two decline shafts, offices, stores, a concentrator plant, a chromitite recovery plant, tailings storage facility and overland ore conveyance.

## Environmental

Environmental management activities include monitoring the status of Environmental Management Programme Reports (EMPRs), WUL applications and Environmental Impact Assessments (EIAs).

Two Rivers is currently not ISO 14001 certified but is aligned with ISO 14001 principles. The Isometrics system to record and manage environmental issues is used and it is Two Rivers' intention to be ISO 14001 certified going forward.

*Team conducting pre-shift risk assessment*

# Two Rivers

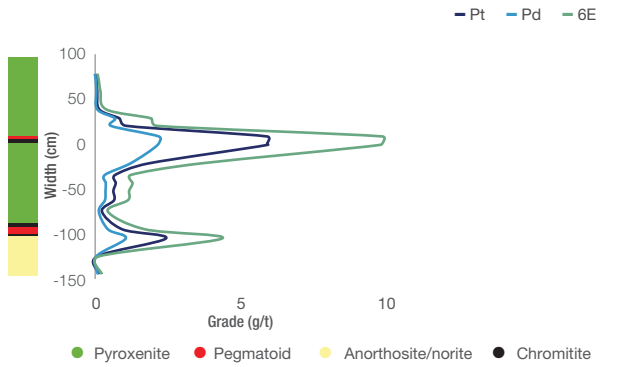
## Geology

The geological succession is illustrated in the generalised stratigraphic column on page 80. The Merensky and UG2 Reefs are separated by a sequence of mostly anorthositic and noritic layered units of some 140m to 160m in combined thickness. Both the Merensky and UG2 Reefs are present but only the UG2 is currently exploited. However, no Merensky Reef is present on Tweefontein and the UG2 Reef only occurs on a small portion of this farm. The UG2 Reef outcrops in the Klein Dwarsrivier valley over a north-south strike of 7.5km and dips to the west at 7° to 10°. Due to the extreme topography, the Merensky Reef outcrops further up the mountain slope.

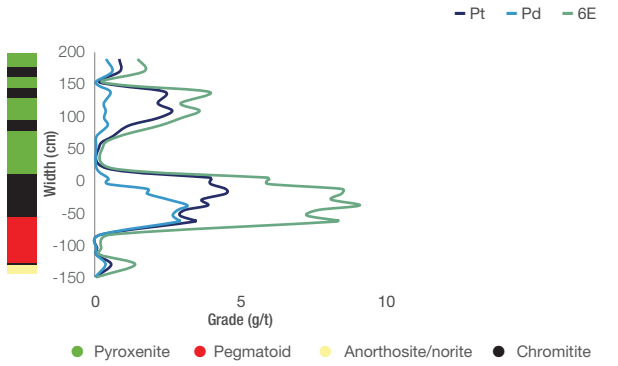
The topography also means that the UG2 occurs at approximately 1 650m below surface on the south-western boundary. The geological succession is broadly similar to other areas of the eastern limb of the Bushveld Complex. An exception is the presence of the Steelpoortpark granite in the south-western part of the project, which is unique to this area. Three distinct reef types have been defined for the UG2 Reef, namely the "normal" reef with a thick main chromitite layer; a "split" reef characterised by an internal pyroxenite/norite lens within the main chromitite layer; and a "multiple split" reef with numerous pyroxenite/norite lenses occurring within the main chromitite layer. The multiple split reef predominates in the southern portion of the mining area. The Merensky Reef is a pyroxenite layer with a chromitite stringer close to the hangingwall contact and also at the basal contact. Mineralisation is primarily associated with the upper and lower chromitite stringers. The graphical illustration of the profiles is shown overleaf.

The geological structure of the area is dominated by the regional north-northeast to south-southwest trending Kalkfontein fault, which has an apparent vertical displacement of 1 200m down throw to the west. A series of sub-parallel faults occur to the south-east adjacent to the Kalkfontein fault, which affect both the Merensky and UG2 Reefs. These faults exhibit variable apparent vertical displacements of between 20m and 110m.

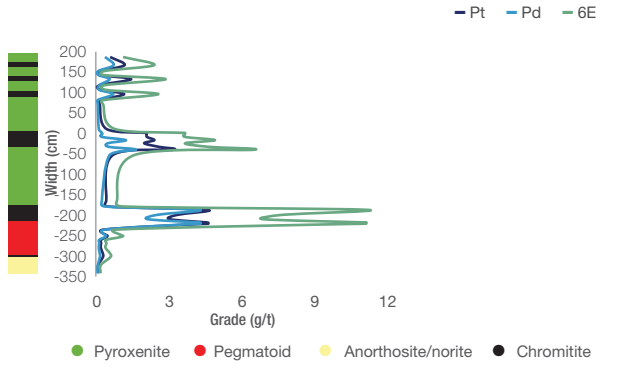
### Two Rivers – Merensky



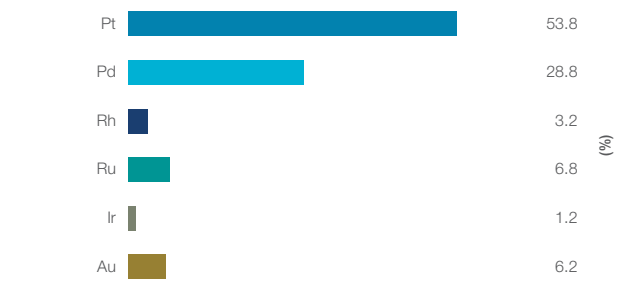

### Two Rivers – UG2 (normal)



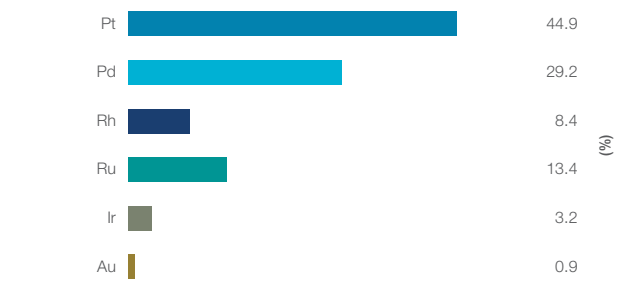

### Two Rivers – UG2 (split)



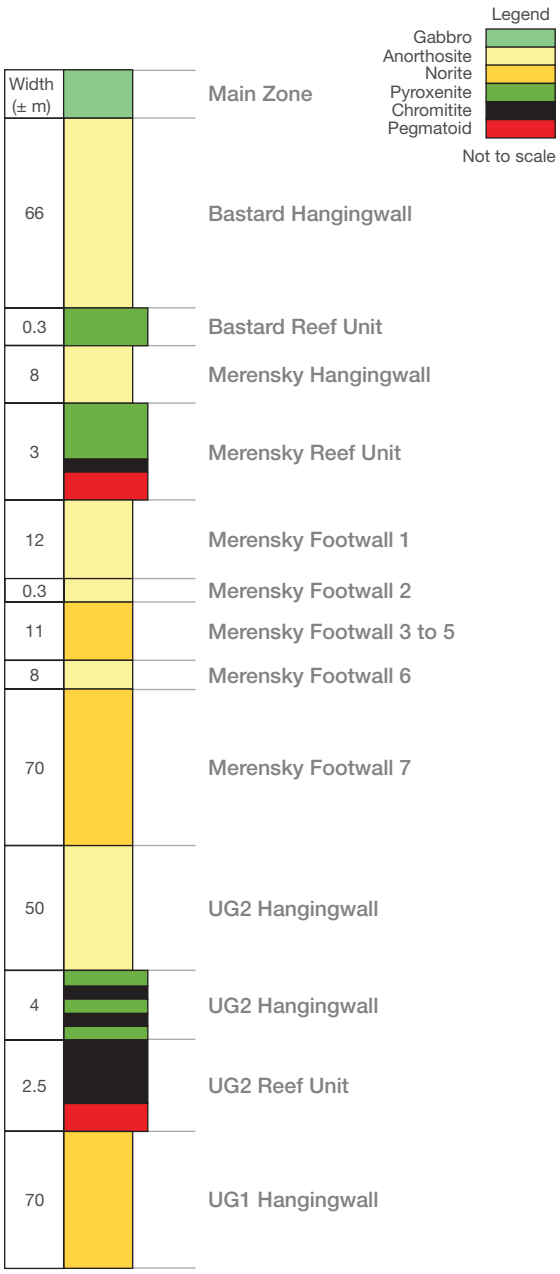

### Two Rivers Merensky 6E metal ratio




### Two Rivers UG2 6E metal ratio



# Two Rivers




GENERALISED GEOLOGICAL SUCCESSION OF THE UPPER PORTION OF THE CRITICAL ZONE: TWO RIVERS

## Exploration

Surface exploration drilling approach is to address the paucity of historical drilling on the farm Buffelshoek 368KT and to conduct a phased surface infill drilling programme to further evaluate the Merensky and UG2 Reefs which are both currently classified as Inferred Resources. During the 2017 financial year four boreholes were drilled on the farm Buffelshoek 368KT for a total of 2 493m at an all-inclusive exploration cost of R6.6 million. Cover and geological delineation drilling was done from underground. In total 151 boreholes were drilled underground (11 463m) at a cost of R5.33 million. Exploration drilling planned for the 2018 financial year include an additional nine boreholes on the farm Buffelshoek 368KT and 181 underground boreholes for cover and geological delineation drilling.

## Mineral Resource estimation and reconciliation

The updated Mineral Resource estimates are tabulated on the next page and reflect total estimates for Two Rivers as at 30 June 2017. Corresponding estimated attributable Mineral Resources are summarised on page 32. Mineral Resources are quoted inclusive of Mineral Reserves and estimated geological losses have been accounted for in the Mineral Resource calculation. Grade estimates were obtained by means of ordinary kriging of UG2 and Merensky Reef borehole intersections. The Merensky Reef model has not been updated in the past two years and the reported estimates are the same as at 30 June 2015.

The Mineral Resources classification for UG2 and Merensky is based on several factors. These include the geological and grade continuity, borehole spacing, geostatistical parameters and the historical classification.

Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

More information regarding the Mineral Resources and Mineral Reserves can be found in the 2017 ARM annual report.

# Two Rivers

## Two Rivers Mineral Resources – 100% (inclusive reporting)

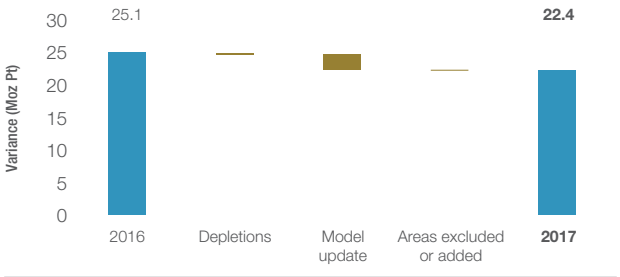
as at 30 June 2017

| as at 30 June 2017 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | UG2 | | | | |
| | | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 60.6 | 99.2 | 159.8 | 14.4 | 62.0 | 80.6 | 157.1 | **316.8** |
| Width | cm | 229 | 148 | | 146 | 163 | 114 | | |
| 4E grade | g/t | 2.85 | 3.61 | 3.32 | 4.44 | 4.36 | 4.73 | 4.56 | **3.93** |
| 6E grade | g/t | 3.11 | 3.92 | 3.61 | 5.43 | 5.28 | 5.60 | 5.46 | **4.53** |
| Ni | % | 0.13 | 0.14 | 0.14 | 0.04 | 0.05 | 0.05 | 0.05 | **0.09** |
| Cu | % | 0.08 | 0.09 | 0.08 | 0.01 | 0.01 | 0.01 | 0.01 | **0.05** |
| 4E oz | Moz | 5.5 | 11.5 | 17.1 | 2.1 | 8.7 | 12.3 | 23.0 | **40.1** |
| 6E oz | Moz | 6.1 | 12.5 | 18.6 | 2.5 | 10.5 | 14.5 | 27.6 | **46.1** |
| Pt oz | Moz | 3.3 | 6.7 | 9.9 | 1.2 | 4.7 | 6.5 | 12.4 | **22.4** |
| Pd oz | Moz | 1.7 | 3.7 | 5.4 | 0.7 | 3.0 | 4.4 | 8.1 | **13.5** |

| as at 30 June 2016 | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Merensky | | | UG2 | | | | |
| | | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 60.6 | 99.2 | 159.8 | 14.9 | 57.9 | 117.8 | 190.6 | **350.4** |
| Width | cm | 229 | 148 | | 152 | 188 | 169 | | |
| 4E grade | g/t | 2.85 | 3.61 | 3.32 | 4.54 | 4.17 | 4.86 | 4.63 | **4.03** |
| 6E grade | g/t | 3.11 | 3.92 | 3.61 | 5.52 | 5.03 | 5.75 | 5.51 | **4.65** |
| Ni | % | 0.13 | 0.14 | 0.14 | 0.04 | 0.05 | 0.04 | 0.04 | **0.09** |
| Cu | % | 0.08 | 0.09 | 0.08 | 0.01 | 0.01 | 0.01 | 0.01 | **0.04** |
| 4E oz | Moz | 5.5 | 11.5 | 17.1 | 2.2 | 7.8 | 18.4 | 28.4 | **45.4** |
| 6E oz | Moz | 6.1 | 12.5 | 18.6 | 2.6 | 9.4 | 21.8 | 33.8 | **52.3** |
| Pt oz | Moz | 3.3 | 6.7 | 9.9 | 1.3 | 4.3 | 9.6 | 15.1 | **25.1** |

The year-on-year comparisons indicate that there has been a change since the 30 June 2016 statement; the main changes can be attributed to model updates, in particular the updates to the Buffelshoek Mineral Resource estimate. The year-on-year reconciliation of the total Two Rivers Mineral Resources is depicted in the accompanying graph.

### Total Two Rivers Mineral Resources



# Two Rivers

## Modifying factors

The modifying factors used to convert Mineral Resources to Mineral Reserves are derived from historical performance while taking future anticipated conditions into account. The following modifying factors were applied to the Mineral Resources:

### Key factors and assumptions

| Merensky Reef | Factors |
|---|---|
| Geological losses | 30% |
| Mineral Resource area | 30 million ca's |
| Relative density | 3.2 – 3.3 |
| Channel width | 179cm |

**Implats long-term price assumptions in today's money (supporting Mineral Reserve estimates): see pages 5 and 30 for the Implats price assumptions**

| UG2 Reef | Factors |
|---|---|
| Geological losses | 22 – 30% |
| Mineral Resource area | 31 million ca's |
| Pillar factors | 15 – 25% |
| Resource dilution | 26 – 30% |
| Mine call factor | 95 – 99% |
| Relative density | 3.6 – 3.8 |
| Channel width | 155cm |
| Stoping width | 249cm |
| Concentrator recoveries | 86 – 88% |

| | 6E metal ratio (%) | |
|---|---|---|
| | Merensky | UG2 |
| Platinum | 53.8% | 44.9% |
| Palladium | 28.8% | 29.2% |
| Rhodium | 3.2% | 8.4% |
| Ruthenium | 6.8% | 13.4% |
| Iridium | 1.2% | 3.2% |
| Gold | 6.2% | 0.9% |

| | Implats interest | Mining right (ha) | Prospecting right (ha) |
|---|---|---|---|
| Two Rivers | 49% | 10 675 | 0 |

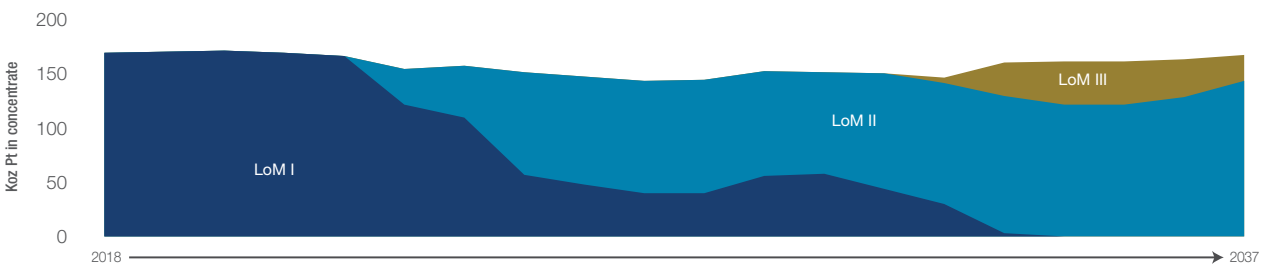
## Mining methods and mine planning

The UG2 orebody is accessed via two decline shaft systems situated 3km apart, namely the Main Decline and the North Decline. Reef production is through a fully mechanised bord and pillar stoping method. A mining section consists of 8m to 12m bords, with pillar sizes increasing with depth below surface. In the shallow areas up to 100m below surface, the pillars are 6m x 6m in size. The bords are mined mainly on strike.

A 3D geological model with layer grades and widths per stratigraphic unit is used in the mine planning. The mine scheduling of the two declines is done in Datamine Studio 5 Planner™. The schedule is evaluated against the grade and thickness block model. The three distinct reef types impact significantly on the mine plan.

Dilution calculations are based on the specific reef type and pay limits are applied to the final mining cut. Hangingwall and footwall overbreak, percentage off-reef, ore remaining (mining losses), geological losses (potholes, faults, dykes and replacement pegmatoid) and a shaft call factor are applied to the planned areas to generate the tonnage and grade profiles.

**Two Rivers 20-year Pt ounce profile**



# Two Rivers

The 20-year profile of Two Rivers is shown on page 82. LoM I constitutes production from the Main and North Decline shafts. LoM II is an extension of the Main and North Decline infrastructure into the Kalkfontein block. The UG2 at Buffelshoek is included in LoM III. The profile is based on assumptions and may change in future. Trial mining and a feasibility study was conducted in 2012/13 on the Merensky Reef. This is on hold as full-scale mining of the Merensky Reef is not economically viable at present. No feasibility study has been concluded in the past year.

## Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimates reflect total estimates for Two Rivers as at 30 June 2017. Corresponding estimated attributable Mineral Reserves are summarised on page 35.

Mineral Reserves quoted reflect the width and grade delivered to the mill rather than an *in situ* channel grade quoted in respect of the Mineral Resources. The modifying factors used in the UG2 Mineral Reserve estimate are based on the mine plan, which envisages a mechanised bord and pillar layout. No Inferred Mineral Resources have been converted into Mineral Reserves. The Mineral Reserves are reflected in both 4E and 6E formats.

Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations. More details regarding the Mineral Resources and Mineral Reserves can be found in the 2017 ARM annual report.

The conversion and classification of Mineral Reserves at Two Rivers is informed by:

- Economic testing at given market conditions (price deck)
- Most of the Indicated Mineral Resources can be classified as Probable Mineral Reserves
- Most of the Measured Mineral Resources can be classified as Proved Mineral Reserves.

## Two Rivers Mineral Reserves – 100%

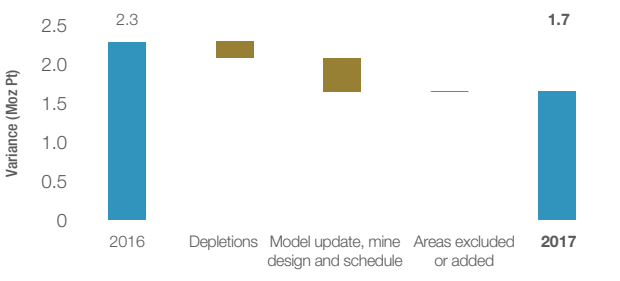
as at 30 June 2017

| as at 30 June 2017 | | | | |
|---|---|---|---|---|
| **Orebody category** | | **Proved** | **UG2 Probable** | **Total** |
| **Tonnes** | Mt | 10.7 | 22.5 | **33.2** |
| **Width** | cm | 236 | 259 | |
| **4E grade** | g/t | 2.96 | 2.77 | **2.83** |
| **6E grade** | g/t | 3.64 | 3.39 | **3.47** |
| **4E oz** | Moz | 1.0 | 2.0 | **3.0** |
| **6E oz** | Moz | 1.3 | 2.5 | **3.7** |
| **Pt oz** | Moz | 0.6 | 1.1 | **1.7** |
| **Pd oz** | Moz | 0.3 | 0.7 | **1.0** |

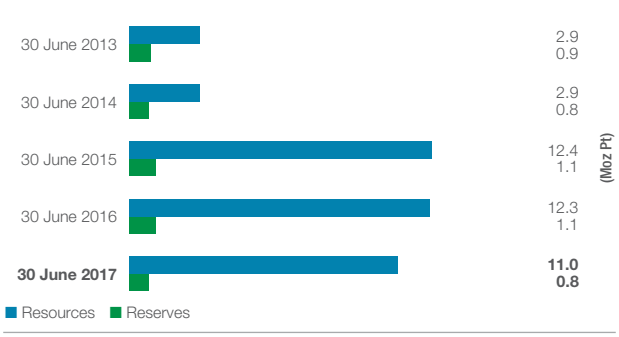
| as at 30 June 2016 | | | | |
|---|---|---|---|---|
| **Orebody category** | | **Proved** | **UG2 Probable** | **Total** |
| **Tonnes** | Mt | 11.7 | 31.5 | **43.3** |
| **Width** | cm | 246 | 278 | |
| **4E grade** | g/t | 3.09 | 2.87 | **2.93** |
| **6E grade** | g/t | 3.76 | 3.48 | **3.56** |
| **4E oz** | Moz | 1.2 | 2.9 | **4.1** |
| **6E oz** | Moz | 1.4 | 3.5 | **4.9** |
| **Pt oz** | Moz | 0.7 | 1.6 | **2.3** |

The year-on-year comparisons indicate that there has been a material change since the 30 June 2016 statement, as the main changes can be attributed to depletion and model updates related to split reef facies. This year-on-year reconciliation of the total Two Rivers Mineral Reserves is depicted in the accompanying graph. In addition the five-year attributable estimated platinum ounces are shown for both Mineral Resources and Mineral Reserves.

### Total Two Rivers Mineral Reserves

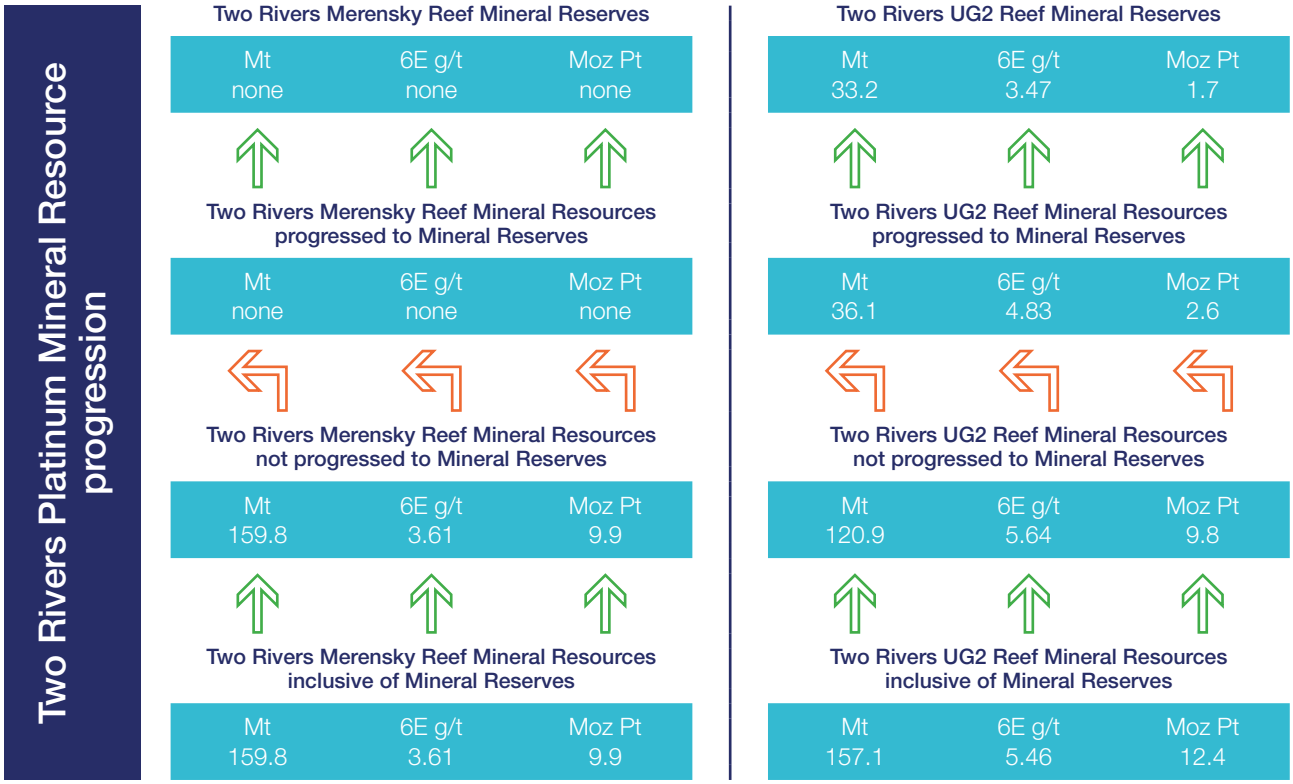



### Two Rivers attributable Mineral Resources and Mineral Reserves



# Two Rivers

A summary illustration of the progression of Mineral Resources to Mineral Reserves is depicted below, showing the total Mineral Resource estimates ("inclusive" style reporting), those Mineral Resources not progressed to Mineral Reserves ("exclusive" style reporting), the proportion of Mineral Resources that are progressed to Mineral Reserves and the summary Mineral Reserves as derived after modifying factors, including dilution.




The larger portion of the Two Rivers Mineral Reserves (70%) is located in the Main Decline block.

**Two Rivers Mineral Reserve distribution**


## Processing

Two Rivers has a concentrator plant on site where initial processing is done. It comprises a standard MF2 design as generally used in the industry. Concentrate is transported by road to Impala Mineral Processes in Rustenburg where further processing takes place in terms of an agreement with IRS.

## Two Rivers top risks

The top risks identified by Two Rivers Mine are:

- Sustained depressed PGM basket prices
- Disruption to operations due to community unrest
- Policy risk arising from change in legislation
- Retaining approval for continuous operations.

## Valuation

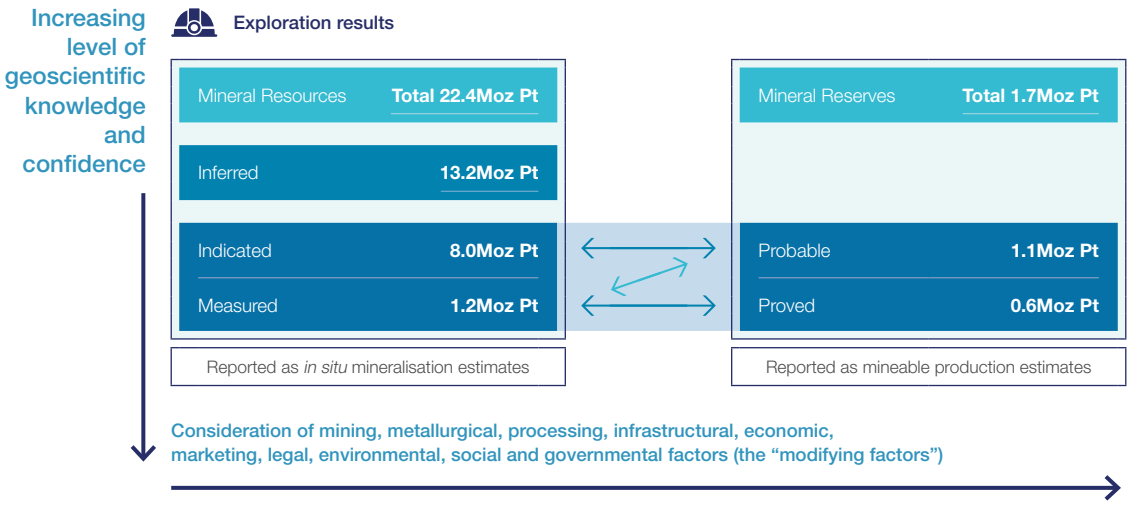
The economic viability of the Two Rivers Mineral Reserves is tested by Implats by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. This is then tested against the internal estimate of the real long-term basket price, the spot price as at 30 June 2017 and a consensus view from various financial institutions. These tests by Implats indicate that the Two Rivers operation requires a real long-term basket price of between R20 000 and R22 000 to be economically viable. While the real spot basket price as at 30 June 2017 was R21 730 (US$1 680), the Two Rivers internal long-term real basket price is R29 700 (US$2 140) and the equivalent calculated consensus price is R26 250 (US$2 030).

# Two Rivers

## Compliance

Two Rivers has adopted the SAMREC Code for its reporting. The Lead Competent Person for Two Rivers Mineral Resources is Shepherd Kadzviti, PrSciNat SACNASP Registration No: 400164/05, a full-time employee of ARM with 27 years of relevant experience. The Lead Competent Person for Two Rivers Mineral Reserves is Michael Cowell, PrSciNat SACNASP Registration No: 400102/02, a full-time employee of Two Rivers with 15 years of relevant experience. Implats has written confirmation from the Competent Persons that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended.

**Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)**



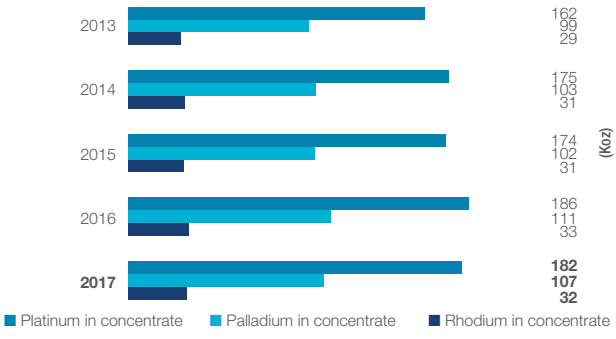

*The UG1 unit at Impala (similar to the geological monument at Dwarsrivier at Two Rivers)*

# Two Rivers

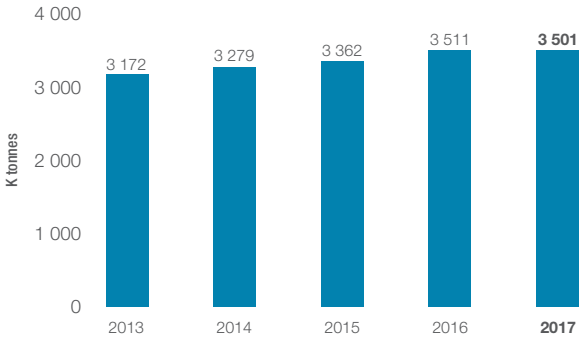
## Key operating statistics

| | | FY2017 | FY2016 | FY2015 | FY2014 | FY2013 |
|---|---|---|---|---|---|---|
| **Production** | | | | | | |
| Tonnes milled ex mine | (000t) | **3 501** | 3 511 | 3 362 | 3 279 | 3 172 |
| Head grade 6E | (g/t) | **3.90** | 4.06 | 3.98 | 4.01 | 4.02 |
| Platinum in concentrate | (000 oz) | **181.9** | 185.9 | 173.5 | 175.1 | 162.2 |
| PGM in concentrate | (000 oz) | **390.2** | 400.7 | 372.6 | 374.7 | 350.4 |
| **Cost of sales** | (Rm) | **(2 872)** | (2 822) | (2 657) | (2 587) | (2 233) |
| On-mine operations | (Rm) | **(1 927)** | (1 785) | (1 714) | (1 657) | (1 581) |
| Concentrating operations | (Rm) | **(424)** | (404) | (359) | (345) | (314) |
| Other | (Rm) | **(521)** | (633) | (584) | (585) | (338) |
| **Total cost** | (Rm) | **2 351** | 2 189 | 2 073 | 2 002 | 1 895 |
| Per tonne milled | (R/t) | **672** | 623 | 617 | 611 | 597 |
| | ($/t) | **49** | 43 | 54 | 59 | 68 |
| Per Pt oz in concentrate | (R/oz) | **12 925** | 11 775 | 11 948 | 11 433 | 11 683 |
| | ($/oz) | **948** | 816 | 1 047 | 1 103 | 1 325 |
| **Financial ratios** | | | | | | |
| Gross margin ex mine | (%) | **27.3** | 27.5 | 27.7 | 29.5 | 22.1 |
| **Capital expenditure** | (Rm) | **293** | 282 | 275 | 319 | 489 |
| | ($m) | **21** | 20 | 24 | 31 | 55 |

### Two Rivers production

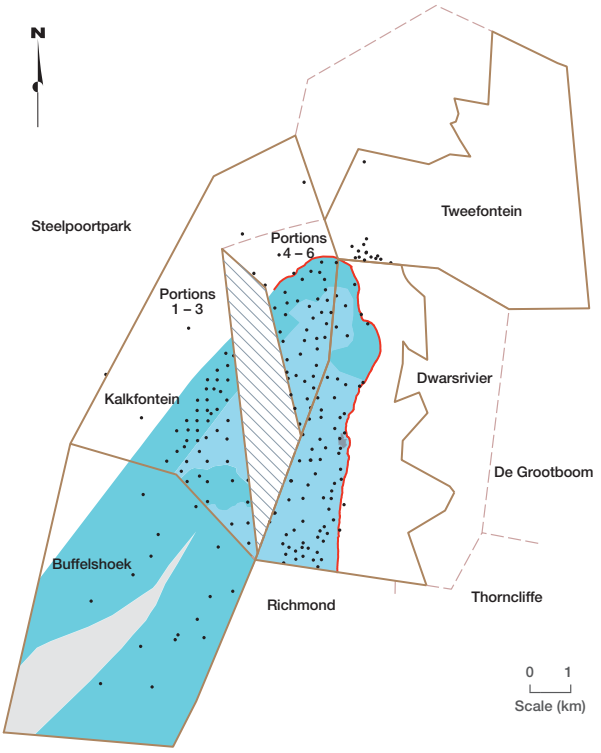



### Tonnes milled

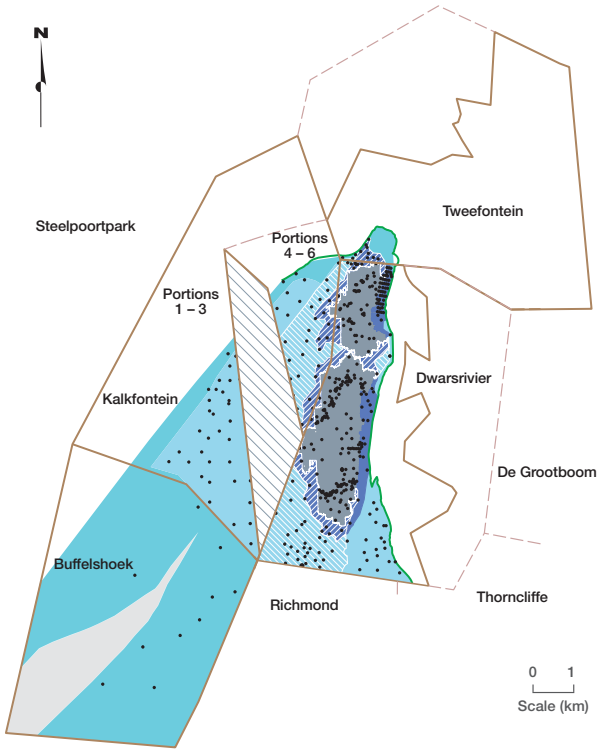


# Two Rivers

## Two Rivers Merensky Mineral Resources




## Two Rivers UG2 Mineral Resources and Mineral Reserves



# Zimplats

In 1986 **Delta Gold Limited** (Delta) acquired rights to its first platinum resources on the **Great Dyke**.

## History

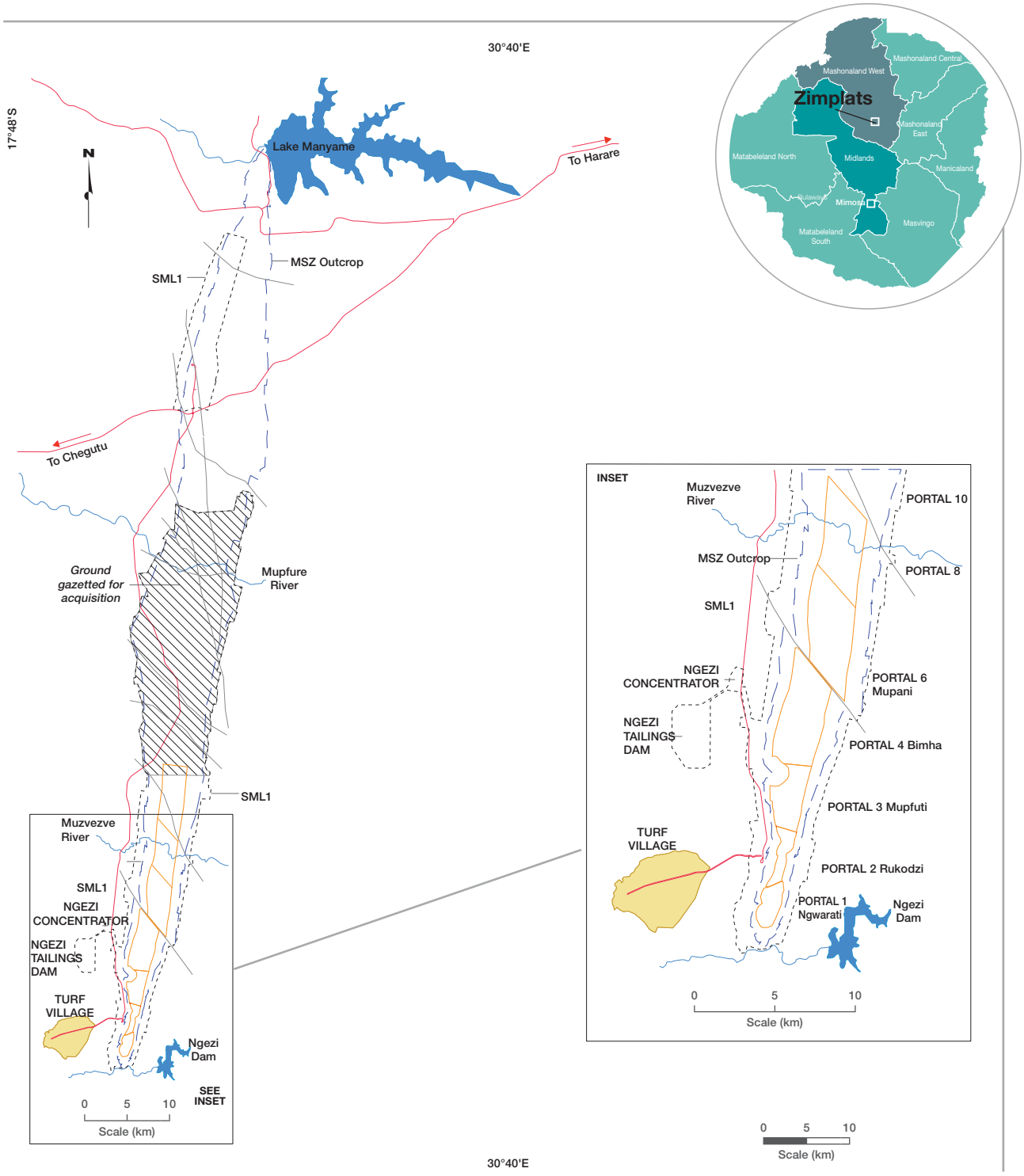
Delta brought BHP into a joint venture (66.7% BHP and 33.3% Delta Gold) to develop Hartley Platinum Mine and development started in 1994. By 1998 Delta Gold had extended its cover to include interests in all the platinum resources of the Hartley Complex. In 1998, Delta Gold demerged its platinum interests into a special purpose vehicle, Zimplats. In 1999 it became apparent that Hartley Platinum Mine had failed to meet its development targets and was put on care and maintenance by BHP. Zimplats subsequently took over BHP's share of Hartley, Selous Metallurgical Complex (SMC) and initiated the Ngezi/SMC project in 2001 with the assistance of Implats and ABSA Bank Investment. A 2.2 million tonne per year open pit mine was established at Ngezi whose ore was trucked to Selous where it was processed in the SMC concentrator and smelting facilities. The first converter matte was exported to South Africa in April 2002 and Implats progressively increased its shareholding in Zimplats until 2003, when it made an unconditional cash offer to minority shareholders in Zimplats. In 2003, Zimplats embarked on the development of underground operations at Ngezi to replace the east and west open pits, which were eventually stopped in 2008. Over the past eight years the production volumes from the operations have been increased to the current 6.2 million tonnes of ore per year from four underground portals and one open pit, all of which feed the two concentrator modules at Ngezi, as well as the SMC concentrator. Currently Implats' shareholding in the entity is 87% with the remaining 13% being held by minority shareholders.

# Zimplats

## Location

Zimplats operations are located in the Mashonaland West province of Zimbabwe as depicted on the accompanying map. Ngezi Mine is located approximately 150km southwest of Harare, at the southern end of the Sebakwe sub-chamber of the Hartley Complex on the Great Dyke. Hartley Mine and the Selous Metallurgical Complex (SMC) are located 80km west-southwest of Harare and 77km north of the Ngezi Mine in the Darwendale sub-chamber of the Hartley Complex of the Great Dyke.

### Zimplats regional locality map



# Zimplats

## Mineral rights

Zimplats holds a special mining lease covering two areas measuring a total of 48 535ha. The special mining lease number 1 (SML1), expires in 2019 and the mining agreement allows for a further two extensions of 10 years each on the same conditions. The Hartley Complex is about 100km long and contains 80% of Zimbabwe's PGM resources. Zimplats, through the special mining lease, controls two-thirds of this.

In March 2013, the GoZ gazetted a preliminary notice of its intention to compulsorily acquire a large portion of ground held under the Zimplats special mining lease and situated to the north of Portal 10 which amounts to approximately 54Moz Pt. In March 2013 Zimplats lodged a formal objection to the preliminary notice to compulsorily acquire the land. From January 2015 Zimplats was actively engaged in discussions with the GoZ in an endeavour to resolve the matter amicably. On 29 June 2016 Zimplats was served with an application filed in the Administrative Court of Zimbabwe in which the GoZ is seeking an order authorising the acquisition by the GoZ of the land described in the preliminary notice referred to above. On 18 November 2016, the GoZ re-issued the gazette using the same co-ordinates as previously gazetted in March 2013. On 13 January 2017 the GoZ again issued, through a *Government Gazette Extraordinary*, a preliminary notice in terms of which it has given fresh notice that it intends to compulsorily acquire land measuring 27 948 hectares within Zimplats' mining lease area. The new notice has repealed all previous notices issued by the GoZ in respect to its proposed compulsory acquisition of this portion of Zimplats' mining lease area. Papers opposing the application were filed on behalf of Zimplats Holdings Limited and Zimplats. Zimplats agreed in principle to release the bulk of the area subject to certain conditions and will still seek to have the matter resolved amicably. Depending on the outcome of the matter in the Administrative Court, or the outcome of any further discussions that Zimplats may have with the GoZ on the matter, the Zimplats Mineral Resources may be significantly reduced.

## Infrastructure

Infrastructure to support production consists of integrated road networks, four production decline portals, one open pit, conveyor networks and ore load out facilities for road trains. Ore processing infrastructure consists of two concentrator modules at Ngezi with a combined capacity of 4Mtpa, one concentrator and a smelter at SMC. Water for the Ngezi operations is drawn from the Ngezi and Chitsuwa Dams. Zimplats' annual allocation from the two dams is 11 000Ml and this exceeds the current requirements. The SMC is located some 77km north of Ngezi Mine with processing infrastructure which includes a 2.2Mtpa concentrator, a 13.5MVA smelter, tailings storage facilities, stores and offices. Water for the SMC operations is abstracted from the Manyane Dam where Zimplats has an annual allocation of 5 000Ml. Power from ZESA's Selous sub-station is fed to the transformers at Ngezi and SMC via the 132kV overhead lines. These assets and the wide network of information technology and communication equipment provide services to the business.

## Environmental

Zimplats is ISO 14001 certified. In line with the environmental management system expectations, all areas are required to identify and report on environmental incidents. Systems are in place to investigate and determine the root causes of high severity incidents, to address and close out these incidents.

One tailing storage facility is located at SMC within the special mining lease area. The tailing storage facility is designed for a deposition rate of 2.4 million tonnes per year and a LoM storage capacity of 72 million tonnes. Additional space is available to extend the tailings facility in future. The tailings storage facility at Ngezi is designed for a ramp up in deposition from 2 million tonnes to 12 million tonnes per year. The current deposition rate is 4.2Mtpa. The tailings dam is designed for a LoM deposition of 450 million tonnes. Tree planting and grassing at Ngezi and the SMC tailings dams are carried out regularly to create a physical barrier and to address the issue of dust from the tailings dam, while efforts are also made to keep the dam moist to suppress dust. The current tailings dam rehabilitation targets new surfaces created as the tailings dam continues to rise.

Zimplats has successfully completed projects to attain 100% compliance with the waste and effluent regulations requirements through the construction of leachate collection systems and landfill lining for both the Ngezi and SMC landfills.

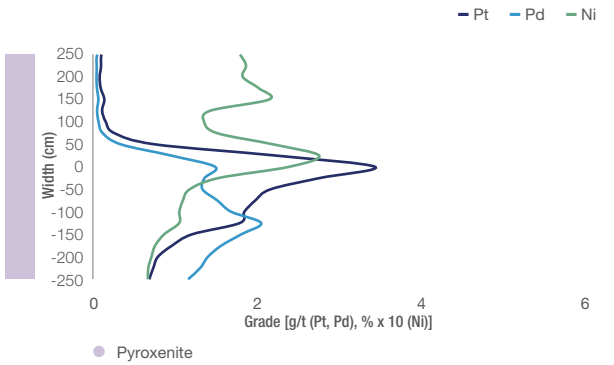
# Zimplats

## Geology

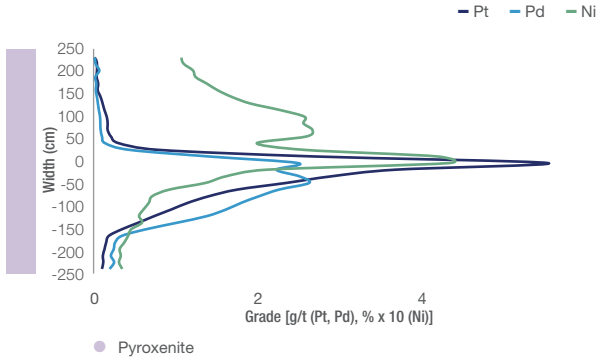
The Great Dyke of Zimbabwe developed as a series of initially discrete magma chamber compartments, which coalesced as the chambers filled. On the basis of structure, style of layering and continuity of layers, the Great Dyke has been sub-divided into five sub-chambers namely the Wedza, Selukwe (Shurugwi), Sebakwe, Darwendale and Musengezi sub-chambers. The stratigraphic units in each sub-chamber are classified into the ultramafic (lower) and the mafic (upper) sequence. The ultramafic rocks are dominated from the base upwards by dunite, harzburgite and pyroxenite, while the mafic rocks consist mainly of gabbro and gabbronorite. Narrow layers of chromitite occur at the base of cyclic units throughout the ultramafic sequence. The platinum-bearing horizon is known as the Main Sulphide Zone (MSZ), which is part of the lower sequence and is located below the contact with the mafic sequence.

The platinum-bearing MSZ is located in the P1 pyroxenite some 5m to 50m below the ultramafic/mafic contact. The MSZ is a continuous layer, 2m to 10m thick, and forms an elongated basin. The zone strikes in a north-north-easterly trend and dips between 5° and 20° on the margins, flattening towards the axis of the basin. Peak base metal and PGM values are offset vertically with palladium peaking at the base, platinum in the centre and nickel towards the top. Visual identification of the MSZ is difficult, therefore systematic monitoring of the reef using various sampling methods is needed to guide mining. The accompanying schematic diagram illustrates the form of the Great Dyke. The geological sequence is illustrated in the accompanying generalised stratigraphic column on the following page.

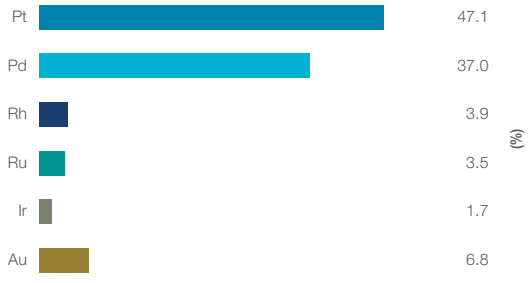
### Ngezi – MSZ

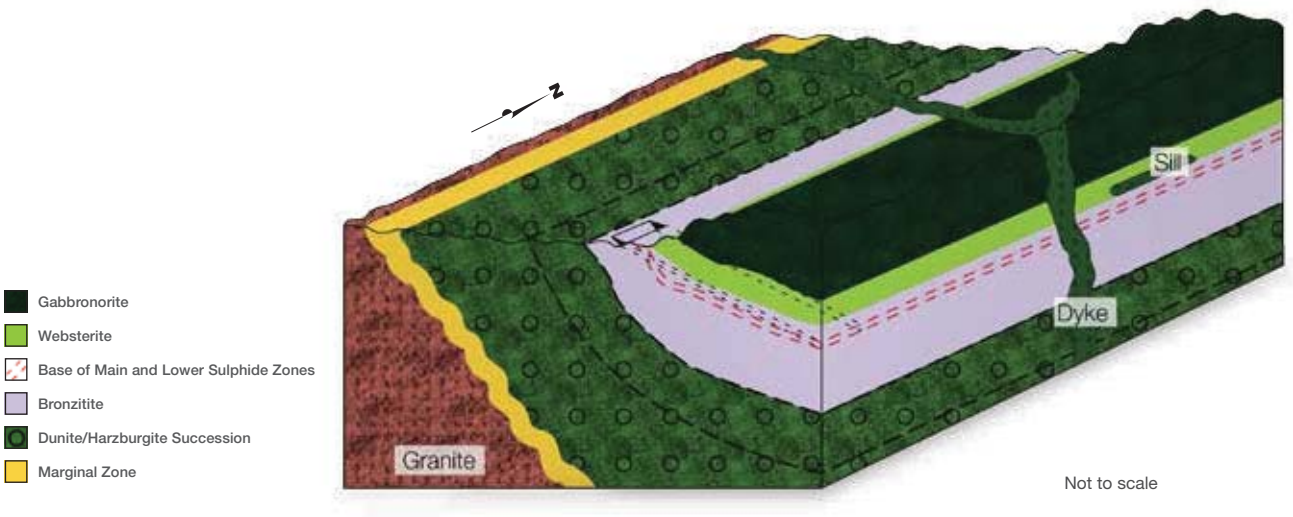



### Hartley – MSZ



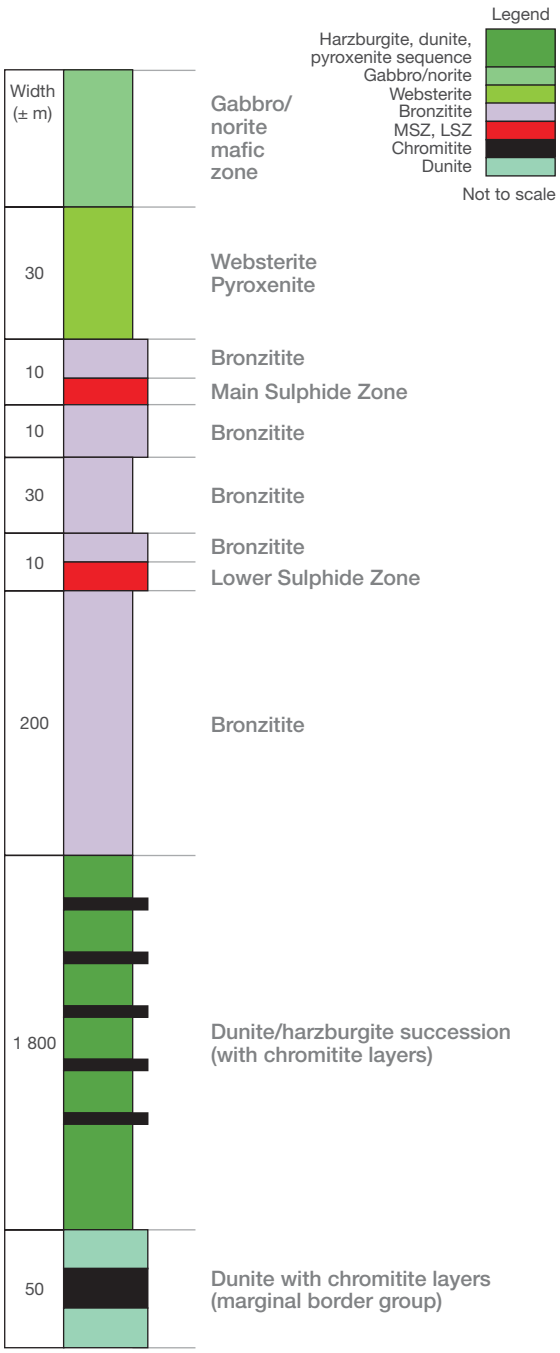

### Zimplats MSZ 6E metal ratio




Not to scale

# Zimplats




GENERALISED GEOLOGICAL SUCCESSION OF THE GREAT DYKE AT ZIMPLATS

## Exploration

Surface exploration drilling for Mineral Resources evaluation and geotechnical assessment was done in the year under review as follows:

- Rukodzi Mine – 2 boreholes in the northern area
- Mupfuti Mine – 11 boreholes
- Bimha Mine – 10 boreholes
- Mupani Mine – 4 boreholes
- Portal 8 – 9 boreholes
- Hartley – 5 twin boreholes

Although samples were taken to Genalysis Laboratory in Bapsfontein during the year the assay results had not been received by the time the Mineral Resources estimates were compiled. Therefore the same resource block models that were used in the previous year were used again this year.

Underground core-recovering drilling was done for reef profiling and geotechnical assessment as follows:

- Ngwarati Mine – 9 boreholes
- Rukodzi Mine – 15 boreholes
- Mupfuti Mine – 23 boreholes
- Bimha Mine – 26 boreholes
- Mupani Mine – 2 boreholes for geotechnical assessment only

All holes were logged and sampled and no new major geological structures were identified.

## Mineral Resource estimation and reconciliation

The updated Mineral Resource estimates as at 30 June 2017 are tabulated on page 94. Corresponding estimated Mineral Resources attributable to Implats are summarised on page 32. Note that the Mineral Resources are quoted inclusive of Mineral Reserves. Day-to-day operations are monitored using in-house lead collection fire assays with AA finish. The Mineral Resources and Mineral Reserves in this statement are based largely on external nickel sulphide collection fire assays with ICP-MS finish. The differences between the methods are incorporated within the modifying factors that have been applied, which means that there may be slight distortions in recovery and other parameters.

# Zimplats

Oxides have lower metallurgical recovery than sulphides with conventional extraction technology and are currently marginal to sub-economic. Oxides are rarely sampled directly, therefore some elements, particularly palladium, may be depleted relative to the figures quoted.

Mineral Resources have been estimated using kriging techniques on assay data derived from surface boreholes. Estimates are based on composite widths that vary depending on cut-off grades, which are based on appropriate economic parameters. The recently completed numerical modelling exercise has confirmed that the revised pillar layout is robust and will arrest any propagation of pillar failure in the mine.

The classification of Mineral Resources at Zimplats is informed by a matrix considering geological complexity and the confidence in the geostatistical estimation. In broad terms confidence is derived from surface borehole spacing and this has the largest weighting on classification of Mineral Resources:

- Borehole spacing of 250m or less supports Measured Mineral Resources
- Borehole spacing between 250m and 500m supports Indicated Mineral Resources
- Borehole spacing greater than 500m supports Inferred Mineral Resources.

Rounding-off of figures in this report may result in minor computational discrepancies. Where this occurs it is not deemed significant. Mineral Resources estimates are inherently imprecise and require the application of judgement and are subject to future revisions. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

More details regarding the Mineral Resources and Mineral Reserves can be obtained from the 2017 Zimplats annual report.

*LHD loading ore at Zimplats*

# Zimplats

## Zimplats Mineral Resources – 100% (inclusive reporting)

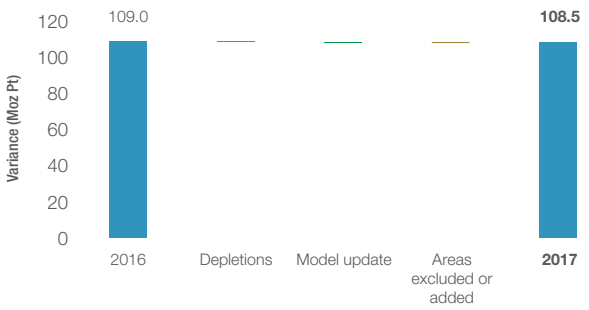
as at 30 June 2017

| as at 30 June 2017 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Ngezi Portals | | | | Mining lease north of Portal 10 | | | Hartley | | | | Oxides – all areas | | | |
| | | Measured | Indicated | Inferred | Total | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 140.2 | 436.5 | 99.7 | 676.4 | 70.0 | 1 021.0 | 1 091.0 | 28.3 | 143.1 | 46.3 | 217.7 | 16.0 | 59.3 | 75.4 | **2 060.4** |
| Width | cm | 250 | 234 | 214 | | 192 | 239 | | 158 | 189 | 191 | | 250 | 225 | | |
| 4E grade | g/t | 3.33 | 3.37 | 3.22 | 3.34 | 3.44 | 3.22 | 3.23 | 4.53 | 3.97 | 3.89 | 4.03 | 3.42 | 3.42 | 3.42 | **3.36** |
| 6E grade | g/t | 3.52 | 3.55 | 3.39 | 3.52 | 3.70 | 3.50 | 3.51 | 4.78 | 4.19 | 4.10 | 4.25 | 3.61 | 3.64 | 3.64 | **3.60** |
| Ni | % | 0.10 | 0.11 | 0.12 | 0.11 | 0.20 | 0.12 | 0.13 | 0.14 | 0.13 | 0.13 | 0.13 | 0.10 | 0.12 | 0.11 | **0.12** |
| Cu | % | 0.08 | 0.08 | 0.08 | 0.08 | 0.18 | 0.09 | 0.10 | 0.12 | 0.11 | 0.10 | 0.11 | 0.07 | 0.10 | 0.09 | **0.09** |
| 4E oz | Moz | 15.0 | 47.3 | 10.3 | 72.6 | 7.7 | 105.7 | 113.4 | 4.1 | 18.3 | 5.8 | 28.2 | 1.8 | 6.5 | 8.3 | **222.6** |
| 6E oz | Moz | 15.8 | 49.8 | 10.9 | 76.5 | 8.3 | 114.9 | 123.2 | 4.3 | 19.3 | 6.1 | 29.7 | 1.9 | 7.0 | 8.8 | **238.3** |
| Pt oz | Moz | 7.4 | 23.6 | 5.5 | 36.5 | 3.4 | 50.2 | 53.6 | 2.0 | 9.3 | 3.0 | 14.2 | 0.9 | 3.2 | 4.1 | **108.5** |
| Pd oz | Moz | 5.9 | 18.2 | 3.6 | 27.6 | 3.2 | 42.7 | 45.8 | 1.6 | 6.8 | 2.1 | 10.6 | 0.7 | 2.6 | 3.2 | **87.3** |

| as at 30 June 2016 | | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Ngezi Portals | | | | Mining lease north of Portal 10 | | | Hartley | | | | Oxides – all areas | | | |
| | | Measured | Indicated | Inferred | Total | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Indicated | Inferred | Total | Total |
| Tonnes | Mt | 145.8 | 466.3 | 72.3 | 684.4 | 70.0 | 1 021.0 | 1 091.0 | 28.3 | 143.1 | 46.3 | 217.7 | 16.0 | 59.3 | 75.4 | **2 068.4** |
| Width | cm | 250 | 233 | 200 | | 192 | 239 | | 158 | 189 | 191 | | 250 | 225 | | |
| 4E grade | g/t | 3.36 | 3.36 | 3.25 | 3.35 | 3.44 | 3.22 | 3.23 | 4.53 | 3.97 | 3.89 | 4.03 | 3.42 | 3.42 | 3.42 | **3.36** |
| 6E grade | g/t | 3.54 | 3.54 | 3.41 | 3.53 | 3.70 | 3.50 | 3.51 | 4.78 | 4.19 | 4.10 | 4.25 | 3.61 | 3.64 | 3.64 | **3.60** |
| Ni | % | 0.11 | 0.11 | 0.12 | 0.11 | 0.20 | 0.12 | 0.13 | 0.14 | 0.13 | 0.13 | 0.13 | 0.10 | 0.12 | 0.11 | **0.12** |
| Cu | % | 0.08 | 0.08 | 0.08 | 0.08 | 0.18 | 0.09 | 0.10 | 0.12 | 0.11 | 0.10 | 0.11 | 0.07 | 0.10 | 0.09 | **0.09** |
| 4E oz | Moz | 15.7 | 50.4 | 7.5 | 73.7 | 7.7 | 105.7 | 113.4 | 4.1 | 18.3 | 5.8 | 28.2 | 1.8 | 6.5 | 8.3 | **223.6** |
| 6E oz | Moz | 16.6 | 53.1 | 7.9 | 77.6 | 8.3 | 114.9 | 123.2 | 4.3 | 19.3 | 6.1 | 29.7 | 1.9 | 7.0 | 8.8 | **239.4** |
| Pt oz | Moz | 7.8 | 25.2 | 4.1 | 37.0 | 3.4 | 50.2 | 53.6 | 2.0 | 9.3 | 3.0 | 14.2 | 0.9 | 3.2 | 4.1 | **109.0** |

The year-on-year reconciliation of the Mineral Resources for Zimplats show only a minor reduction; this relates mostly to mining depletion.

### Total Zimplats Mineral Resources



# Zimplats

## Modifying factors

The modifying factors used to convert Mineral Resources to Mineral Reserves are derived from historical performance while taking future anticipated conditions into account. The following modifying factors were applied to the resources:

### Key factors and assumptions

| Main Sulphide Zone | Factors |
|---|---|
| Geological losses | 5 – 26% |
| Mineral Resource area | 337 million ca's |
| Pillar factors | 20 – 34% |
| Resource dilution | 6 – 10% |
| Mine call factor | 91% |
| Relative density | 3.18 – 3.25 |
| Resource width | 236cm |
| Stoping width | 265cm |
| Concentrator recoveries | 80 – 81% |

**Long-term price assumptions in today's money (supporting Mineral Reserve estimates): see pages 5 and 30 for the Implats price assumptions**

| Zimplats portal names | | 6E metal ratio (%) Main Sulphide Zone |
|---|---|---|
| Portal 1 | Ngwarati | Platinum 47.1% |
| Portal 2 | Rukodzi | Palladium 37.0% |
| Portal 3 | Mupfuti | Rhodium 3.9% |
| Portal 4 | Bimha | Ruthenium 3.5% |
| Portal 6 | Mupani | Iridium 1.7% |
| | | Gold 6.8% |

| | Implats interest | Mining right (ha) | Prospecting right (ha) |
|---|---|---|---|
| Zimplats | 87% | 48 535 | 0 |

*Bimha portal Zimplats*

# Zimplats

## Mining methods and mine planning

The current mine infrastructure consists of five portals (decline shafts) and one open pit. The deepest operating depth is some 310m at Bimha Mine (Portal 4). Boundaries between individual portals are usually based on a maximum strike length of 3km for Portals 1 to 3, or are terminated on known geological discontinuities such as major faults. The strike length for Bimha, Mupani and future mines will be on 6km. This increased strike length significantly improves the capital efficiency of mining investments. Minor faults and other geological discontinuities are present at the operations and are accounted for as geological losses during the Mineral Resources and Mineral Reserves estimation process.

At all the underground portals, Zimplats employs a mechanised room and pillar mining method on a narrow reef to extract ore from stopes whose nominal width is 2.5m at dips of less than 9°. The trackless mechanised machinery consist of low profile single boom face rigs for drilling, low profile roof bolters for support drilling, 10t load and dump (LHDs) and 30t dump trucks. A self-directed work team (SDWT) is allocated about 20 rooms and its total face length is dependent on the sizes (widths) of the pillars and rooms. This enables the SDWT to adhere to a mining cycle consisting of face drilling and blasting, support installation and loading and hauling with adequate redundancy to achieve set production targets. At Rukodzi and Ngwarati Mines, the broken rock is loaded onto trucks by LHD and trucked to a surface crusher. Mupfuti Mine has an underground crushing plant and ore is tipped to the crusher and conveyed to surface.

The production target for each fleet varies from 17 500t to more than 20 000t of ore per month, depending on the particular mine, ground conditions and the existing pillar layout. The typical layout comprises 7m panels with different sizes of in-stope pillars, which are determined by the depth below surface and these are surrounded by barrier pillars setting out on a 200m x 200m ‘paddock’. This pillar layout is meant to contain the likelihood of cascading pillar failure should in-stope pillars fail. Ngwarati and Rukodzi Mines do not have barrier pillars nor paddocks owing to their shallow depth below surface.

At all the portals, the spans of rooms may decrease and pillar dimensions may increase in bad ground. A combination of roof bolts and tendons is integral to the support design.

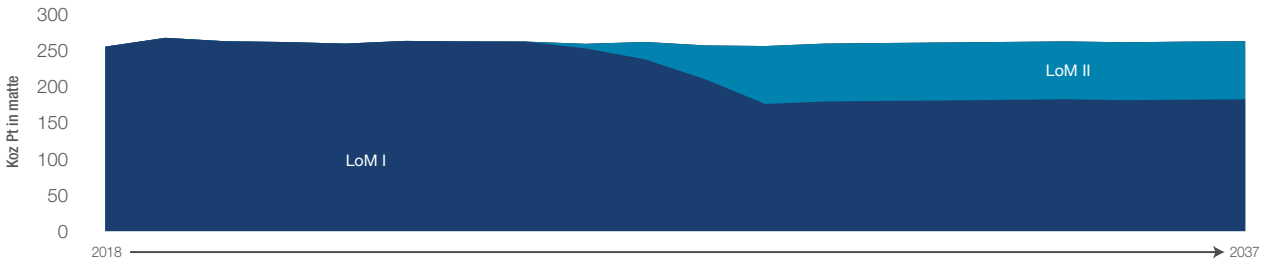
During the 2015 financial year, there was extensive support pillar failure that led to cascading collapse of a larger footprint, which was initiated in pillars in the deeper sections of Bimha Mine. This was mainly attributed to the influence of a low angle shear that is prevalent at the mine. The shear undulates between the hangingwall and footwall of the reef horizon and has a deleterious effect on pillar strength, which contributed to this collapse. Exposure of the shear to water and air in the course of mining operations contributed to the deterioration of ground conditions. Geotechnical investigations carried out by independent geotechnical consultants recommended a new pillar layout that will prevent the likelihood of cascading pillar failure. The new pillar layout was adopted at Mupfuti and Bimha Mines and will be used for all new projects Zimplats develops in the future. The extraction ratio based on the new pillar layout is below 70%, compared to above 80% on the old pillar layout. The reduced extraction percentages in the mines are reflected in the Mineral Reserves.

Bimha Mine redevelopment is on target and all redeployed teams are set to return to Bimha as per the redevelopment schedule. The mine will ramp up to full production by April 2018 and the South Pit operation will subsequently be shut down.

A total combined production of 6.2Mtpa will be sustained beyond the next 30 years as new portals are on course to replace the mature Rukodzi and Ngwarati Mines. The Mupani Mine feasibility study for a 2.2Mtpa mine was approved in November 2016 and this operation will replace the two mines in FY2022 and FY2025 respectively. The mining envelopes for the trackless operations have been increased from 3km on strike to 6km as Mupani Mine (Portal 6) will take up the production volumes for both mines. The production from the new mine is meant to feed ore to the SMC concentrator. The high level LoM profile is depicted in the accompanying graph. Portal 8 (LoM II) is seen as the next mine to be developed and evaluation work on this project has commenced, in particular to better understand the geological structures. The Hartley Mine remains on care and maintenance and provides additional opportunity for future production.

Trial mining is being undertaken to establish a viable solution to extract the steeper dipping portions of the orebody (the steeps). The success of such studies could have a material positive impact in future on the Mineral Reserves and LoM profiles at Zimplats.

**Zimplats 20-year LoM Pt ounce profile**



# Zimplats

## Mineral Reserve estimation and reconciliation

The Zimplats Mineral Reserve Statement as at 30 June 2017 is shown alongside. Corresponding estimated Mineral Reserves attributable to Implats are summarised on page 35. The Mineral Reserves quoted reflect anticipated grades delivered to the mill.

The conversion and classification of Mineral Reserves at Zimplats is informed by:

- Feasible mine plan and project studies, board approval and available funding
- Economic testing at given market conditions (price deck)
- Indicated Mineral Resources can be classified as Probable Mineral Reserves if the mine plan, approval, funding and economic test is passed
- Measured Mineral Resources can be classified as Proved Mineral Reserves if the mine plan approval, funding and economic test is passed
- In certain exceptional circumstances the Competent Person may elect to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the modifying factors is being confirmed
- No Inferred Mineral Resources are converted to the Mineral Reserve category.

More details regarding the Mineral Resources and Mineral Reserves can be obtained from the 2017 Zimplats annual report on **www.zimplats.com**.

## Zimplats Mineral Reserves – 100%

as at 30 June 2017

| as at 30 June 2017 | | | | |
|---|---|---|---|---|
| **Orebody category** | | **Proved** | **Probable** | **Total** |
| **Tonnes** | Mt | 63.6 | 101.5 | **165.1** |
| **Width** | cm | 266 | 265 | |
| **4E grade** | g/t | 3.25 | 3.26 | **3.25** |
| **6E grade** | g/t | 3.43 | 3.44 | **3.43** |
| **Ni** | % | 0.10 | 0.09 | **0.10** |
| **Cu** | % | 0.07 | 0.08 | **0.08** |
| **4E oz** | Moz | 6.6 | 10.6 | **17.3** |
| **6E oz** | Moz | 7.0 | 11.2 | **18.2** |
| **Pt oz** | Moz | 3.3 | 5.3 | **8.6** |
| **Pd oz** | Moz | 2.6 | 4.1 | **6.7** |

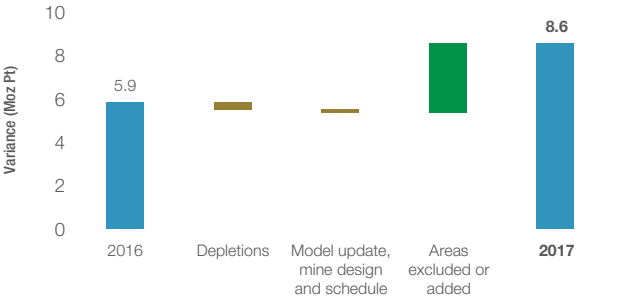
| as at 30 June 2016 | | | | |
|---|---|---|---|---|
| **Orebody category** | | **Proved** | **Probable** | **Total** |
| **Tonnes** | Mt | 51.3 | 60.1 | **111.5** |
| **Width** | cm | 276 | 275 | |
| **4E grade** | g/t | 3.31 | 3.31 | **3.31** |
| **6E grade** | g/t | 3.50 | 3.49 | **3.50** |
| **Ni** | % | 0.10 | 0.10 | **0.10** |
| **Cu** | % | 0.07 | 0.07 | **0.07** |
| **4E oz** | Moz | 5.5 | 6.4 | **11.9** |
| **6E oz** | Moz | 5.8 | 6.8 | **12.5** |
| **Pt oz** | Moz | 2.7 | 3.2 | **5.9** |

The year-on-year reconciliation of the Mineral Reserves at Zimplats shows a large increase due to the conversion of Mupani Mine (Portal 6) to the Mineral Reserve category. More details related to this change can be found on the Zimplats website **www.zimplats.com**.

The distribution of Mineral Reserves at the different portals is shown alongside, indicating the varying sizes and remaining production potential.

### Zimplats Mineral Reserve distribution

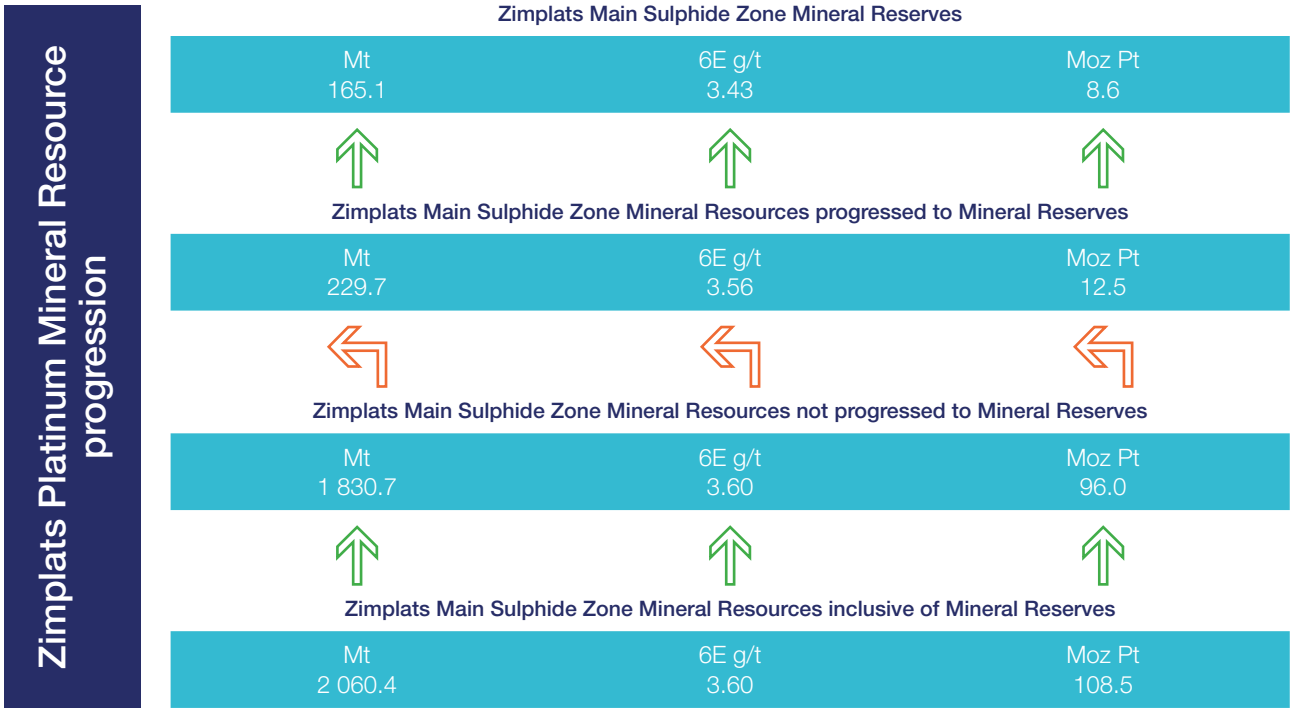

### Total Zimplats Mineral Reserves




### Zimplats attributable Mineral Resources and Mineral Reserves

# Zimplats

The transparent Mineral Resource progression for Zimplats is illustrated below, including a summary of the total Mineral Resources ("inclusive" of Mineral Reserves), that part of the Mineral Resources that is not progressed to Mineral Reserves ("exclusive" style reporting), the part of the Mineral Resources that is progressed to Mineral Reserves and also the Mineral Reserves.




## Processing

Ore from the mines is processed by two concentrators (one at SMC and the other at Ngezi). The concentrator at Ngezi has two similar modules, which were commissioned in 2009 and 2013 respectively. Each module has a capacity of 2Mtpa, which makes up a total of 4Mtpa. The SMC concentrator has a capacity of 2.2Mtpa. Approximately one-third of the mined ore (2.2 million tonnes) is transported by road trains to the concentrator at SMC, which operates a single semi-autogenous grinding mill (SAG), while the rest is transported by overland conveyor system to the crusher and ball mill concentrator modules at Ngezi.

Concentrate from both Ngezi plants and SMC is then smelted in an arc furnace and converted to matte at SMC. The resulting matte is despatched to Impala's refinery in Springs under the terms of a life-of-mine agreement with IRS.

## Zimplats top risks

The Group risk management process is briefly described on page 14 where the top 10 Group risks are listed. In this context the top risks identified at Zimplats are:

- Sustained depressed PGM basket prices
- Excessive taxation and levies
- Failure to progress beneficiation
- Unavailability of secure and reliable power
- Uncertainty regarding indigenisation.

Control measures to mitigate against these risks are in place.

# Zimplats

## Valuation

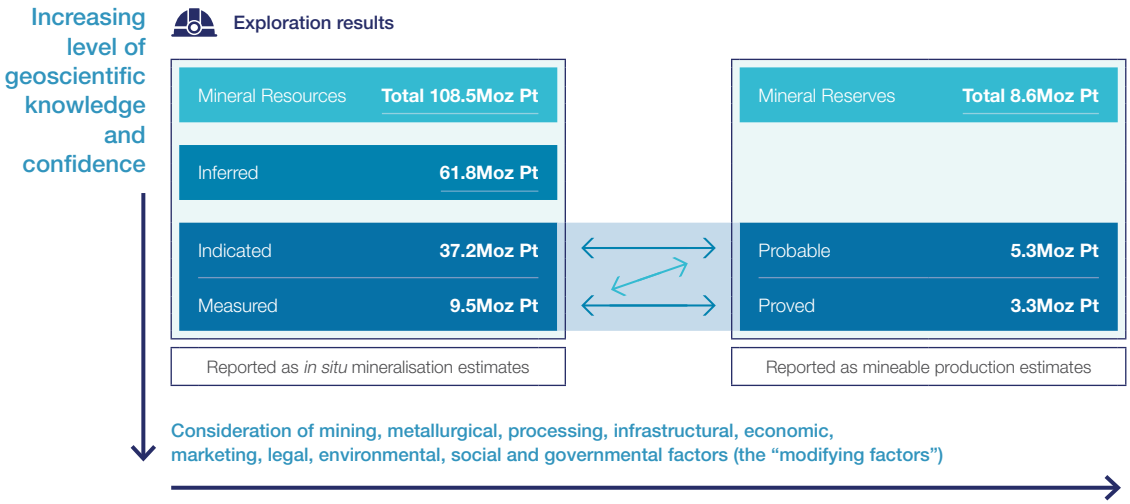
The economic viability of the Zimplats Mineral Reserves is tested by Implats by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. This is then tested against the internal Zimplats estimate of the real long-term basket price, the spot price as at 30 June 2017 and a consensus view from various financial institutions. These tests indicate that the Zimplats operation requires a real long-term basket price of between R26 000 and R28 000 to be economically viable. While the real spot basket price as at 30 June 2017 was R25 460 (US$1 970), the Zimplats internal long-term real basket price is R34 800 (US$2 500) and the equivalent calculated consensus price is R31 260 (US$2 410).

## Compliance

Zimplats Mineral Resources and Mineral Reserves are estimated and reported in accordance with the Implats code of practice for the estimation, classification and reporting of Mineral Resources and Mineral Reserves. The code of practice is an Implats Group-wide protocol that seeks to provide more prescriptive guidance than the Australasian Code for Reporting Exploration Results, Mineral Resources and Mineral Reserves, the Joint Ore Reserve Committee Code (JORC Code), 2012 edition. Zimplats Mineral Resources and Mineral Reserves also meet the requirements of the Code for the Technical Assessment and Valuation of Mineral and Petroleum Assets and Securities for Independent Experts reports, the VALMIN Code, 2005 edition.

The Lead Competent Persons designated in terms of the JORC Code, who took responsibility for the reporting of Mineral Resources and Mineral Reserves as at 30 June 2017, are Steven Duma (PrSciNat), AusIMM and Caston Mutevhe (PrEng) ECSA, SAIMM who are full-time employees of Zimplats. Steve is responsible for Mineral Resources and has 20 years of experience in mining and exploration of which eight years have been in platinum in Zimbabwe and South Africa. Caston is responsible for Mineral Reserves and has 23 years of experience in mining of which eight years have been in the platinum mining industry in Zimbabwe. Implats has written confirmation from the Lead Competent Persons that the information disclosed in terms of these paragraphs are compliant with the JORC Code and, where applicable, the relevant JORC Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended.

**Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)**

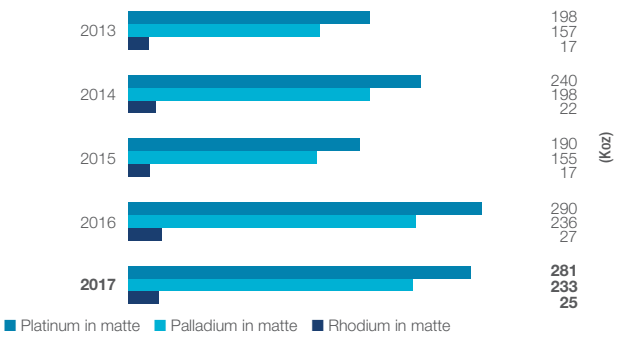


# Zimplats

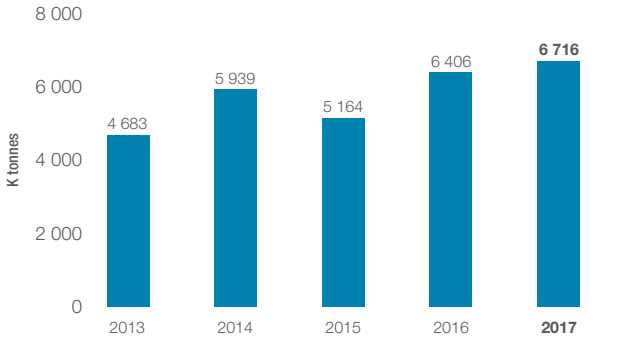
## Key operating statistics

| | | FY2017 | FY2016 | FY2015 | FY2014 | FY2013 |
|---|---|---|---|---|---|---|
| **Production** | | | | | | |
| Tonnes milled ex mine | (000t) | **6 716** | 6 406 | 5 164 | 5 939 | 4 683 |
| Head grade 6E | (g/t) | **3.49** | 3.48 | 3.47 | 3.47 | 3.53 |
| Platinum in matte | (000 oz) | **281.1** | 289.8 | 190.0 | 239.7 | 198.1 |
| PGM in matte | (000 oz) | **601.7** | 616.9 | 406.0 | 515.8 | 416.2 |
| **Cost of sales** | (Rm) | **(5 753)** | (6 198) | (4 181) | (3 934) | (2 708) |
| On-mine operations | (Rm) | **(2 828)** | (2 904) | (2 071) | (1 850) | (1 350) |
| Processing operations | (Rm) | **(1 514)** | (1 572) | (1 232) | (1 139) | (711) |
| Other | (Rm) | **(1 411)** | (1 722) | (878) | (945) | (647) |
| **Total cost** | (Rm) | **4 787** | 4 721 | 3 650 | 3 208 | 2 283 |
| Per tonne milled | (R/t) | **713** | 737 | 707 | 540 | 488 |
| | ($/oz) | **52** | 51 | 62 | 52 | 55 |
| Per Pt oz in matte | (R/oz) | **17 030** | 16 291 | 19 211 | 13 383 | 11 524 |
| | ($/oz) | **1 249** | 1 130 | 1 683 | 1 291 | 1 307 |
| **Financial ratios** | | | | | | |
| Gross margin ex mine | (%) | **18.3** | 8.2 | 10.3 | 34.1 | 34.9 |
| **Capital expenditure** | (Rm) | **863** | 981 | 968 | 1 166 | 1 381 |
| | ($m) | **63** | 68 | 85 | 112 | 157 |

### Zimplats production



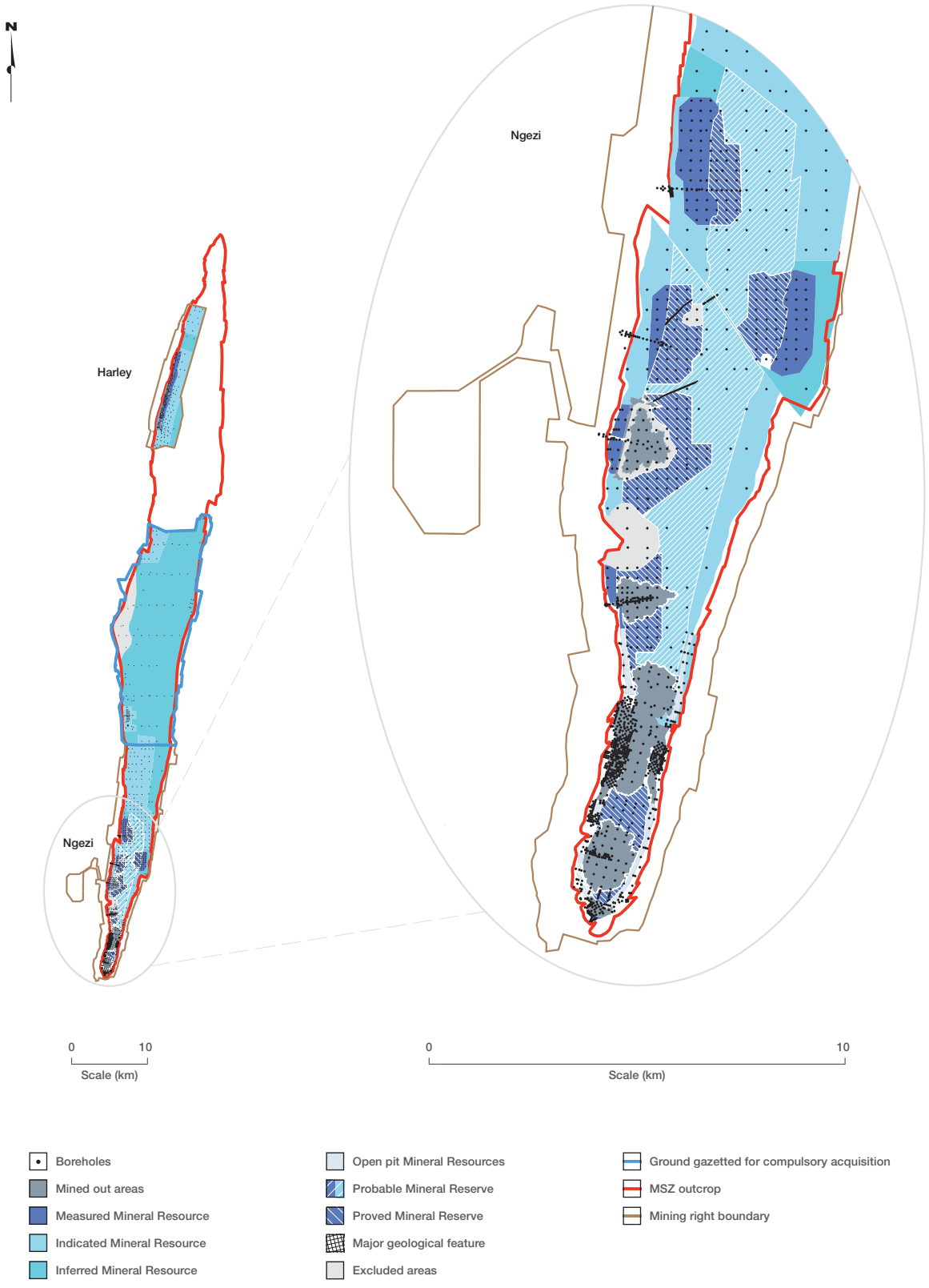

### Tonnes milled




*Ore haulage by road train at Bimha Mine, Zimplats*

# Zimplats

## Zimplats MSZ Mineral Resources and Mineral Reserves



# Mimosa

**Mining operations** started in the Mining Company (Mimosa) area in 1926 with mineral extraction from oxide ores in the North Hill.

## History

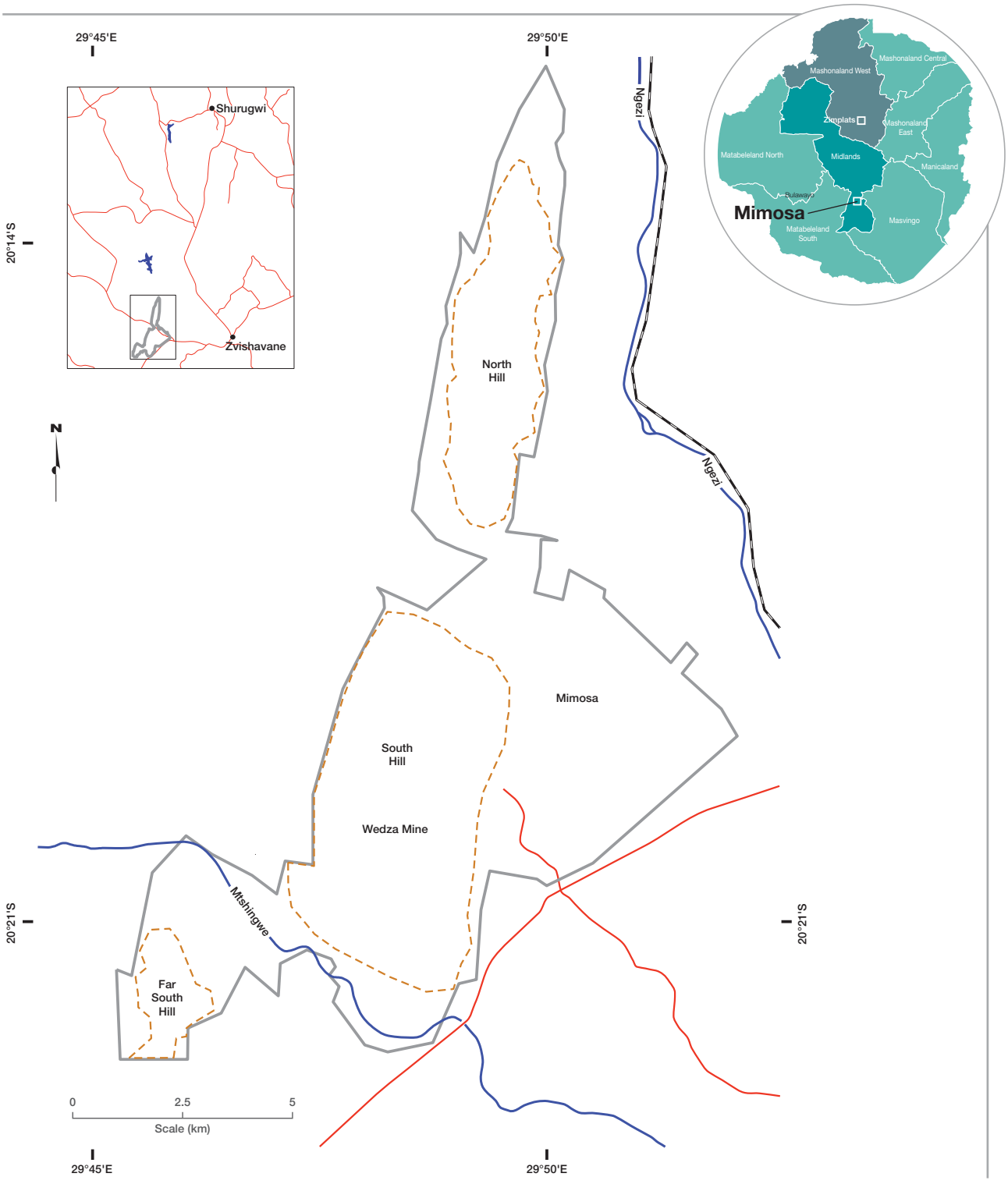
Operations lasted approximately two years and approximately 60oz of platinum was recovered. Union Carbide Zimbabwe secured an EPO in the Wedza area over the Mimosa deposit in 1962. Exploration and trial mining were periodically undertaken over a 30-year period. Mimosa was acquired by Zimasco from Union Carbide in 1993. Zimasco piloted platinum mining in Zimbabwe by resuscitating the operation and steadily increasing production to 1 000 tonnes per day, which was achieved in 1998. In July 2001, Implats acquired a 35% stake in Mimosa and increased this stake to 50% with a further acquisition of 15% in August the following year. Aquarius acquired a 50% stake in Mimosa during the same year. Sibanye-Stillwater concluded a deal on 12 April 2016 which resulted in Sibanye-Stillwater acquiring all the shares that formerly belonged to Aquarius. Mimosa is wholly owned by Mimosa Investments Limited, a Mauritius-based company held by Implats and Sibanye-Stillwater in a 50:50 joint venture.

# Mimosa

## Location

Mimosa Mining Company is situated 32km west from Zvishavane town, about 340km southwest from the capital city of Harare. It is located on the Wedza geological complex of the Great Dyke, about 150km east of Bulawayo in the southern part of the Midlands province, Zimbabwe. The Mimosa Mine is located some 80km south-south west of the Unki Platinum Mine which is operated by Anglo Platinum.

### Mimosa regional locality map



# Mimosa

## Mineral rights

The Mimosa mining rights are covered by a contiguous mining lease covering an area of 6 594 hectares. The mining lease, namely Lease No 24, was granted to Mimosa on 5 September 1996. The lease was registered for nickel, copper, cobalt, gold, silica, chromite and platinum group minerals and Mimosa Mining Company (Pvt) Ltd currently holds the mining rights to that lease. The lease agreement gives Mimosa exclusive mining rights for PGMs and base metals within the vertical limits of its boundary.

The GoZ has been pursuing the greater participation in the mining sector by indigenous Zimbabweans. Implats is continuing to engage with the GoZ with respect to agreeing plans for the indigenisation of Mimosa. The current position on the implementation of the indigenisation plans remains unclear and depending on what position is ultimately taken by the GoZ, Implats' attributable Mineral Resources and Mineral Reserves may be significantly reduced. The indigenisation plan has not been completed and the reported attributable Mineral Resources and Mineral Reserves are still at the same attributable ownership level of 50%.

Discussions continue with the GoZ regarding the studies and options for Mimosa Mine to beneficiate concentrate. Given the current depressed metal price regime it is for example seen that the potential implementation of a 15% beneficiation tax on platinum revenue could render Mimosa Mine unprofitable depending on future prices. Such a scenario will have a material impact on the Mimosa Mineral Resource and Mineral Reserve Statement.

Given the above, it must be noted that Mimosa has the legal entitlement to the minerals being reported upon without any known impediments.

## Infrastructure

The mining operation is well established with a mature infrastructure. The mine currently extracts 2 900Ml raw water per annum from the Khumalo weir. The weir is 6km from the mine and located in the Ngezi River. The river is supplied downstream from the Palawan Dam. Water is released from the dam for the mine and other water use permit holders.

The power supply to the mine is through a 132kV overhead powerline feeder teeing off Mberengwa switching station located some 15km south of the Mimosa Mine consumer sub-station. The maximum load capacity of the line feeding the mine consumer sub-station is 118MVA. It is adequate to accommodate an additional load.

The access tar road to the mine is in a good condition and well maintained. The nearest railway station (Bannockburn) is 16km from the mine.

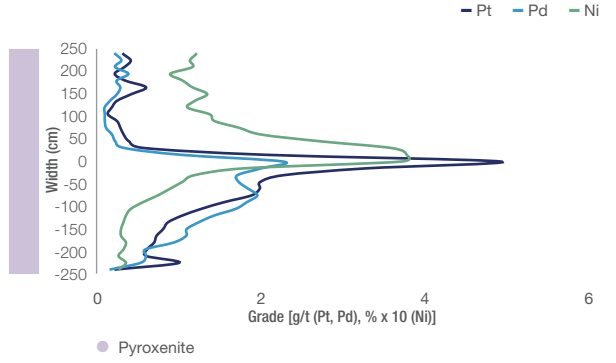
## Environmental

All environmental parameters are covered in the mine's Environmental Impact Assessment (EIA) covering the whole mining lease. Project specific EIAs are also carried out as and when required. Mimosa is certified to operate on ISO 14001 and OSHAS 18001 business management systems which cover the environmental and employees' occupational safety respectively. The ISO 14001 business management system has a comprehensive method of identifying, implementing, monitoring and tracking of all aspects and impacts of its activities to the environment.

## Geology

The geological succession at Mimosa is illustrated in the accompanying generalised stratigraphic column. PGM mineralisation at Mimosa is located in four erosionally isolated and fault-bounded blocks, namely, from north to south, the North Hill orebody, South Hill orebody, Mtshingwe Block orebody and Far South Hill orebody areas. Each of these blocks is host to a pyroxenite layer known as the P1 pyroxenite layer which is overlain by a layer of gabbro. The platinum bearing Main Sulphide Zone (MSZ) is located in the P1 pyroxenite some 10m below the ultramafic/mafic contact. The MSZ is a continuous layer, 2m to 3m thick, and forms an elongated basin. The zone strikes in a north-northeasterly trend and dips at about 14° on the margins flattening towards the axis of the basin.

**Mimosa – MSZ**




**Mimosa MSZ 6E metal ratio**

# Mimosa

The MSZ at Mimosa has a well-defined grade profile where peak base metal and PGM values are offset vertically, with palladium dominant towards the base, platinum in the centre and nickel towards the top. At Mimosa the MSZ is visually identified using pyroxene and sulphide mineralisation followed by confirmatory channel sampling. Minor faults and dykes are present at Mimosa. Although no potholes have been identified, low-grade areas and areas of no mineralisation, or "washouts", have been intersected. These are all accounted for in the Mineral Resource and Mineral Reserve Statement. The 6E metal ratios are shown in the accompanying graph. This is similar to the distribution at Zimplats.

## Exploration

The lease area has been explored by a total of 467 exploration core-recovering boreholes of which 110 are on the North Hill deposit and 22 on the Far South Hill. The area has also been explored by surface mapping and trenching. The boreholes were drilled and assayed over a series of drilling campaigns spanning the life of the mine period. All drill core is largely NQ size though the unconsolidated part of the hole is drilled HQ size. All boreholes are logged lithologically and geotechnically. All lithological and assay data are verified for integrity before being imported into the database. During 2016 nine boreholes were drilled with a total length of 1 700m of core on the South Hill orebody. No exploration drilling from surface was done at Mimosa during the past financial year, however, 30 boreholes were drilled underground, mainly for ground conditions, cover, as well as to investigate faults and unpay zones ahead of advancing mining teams.

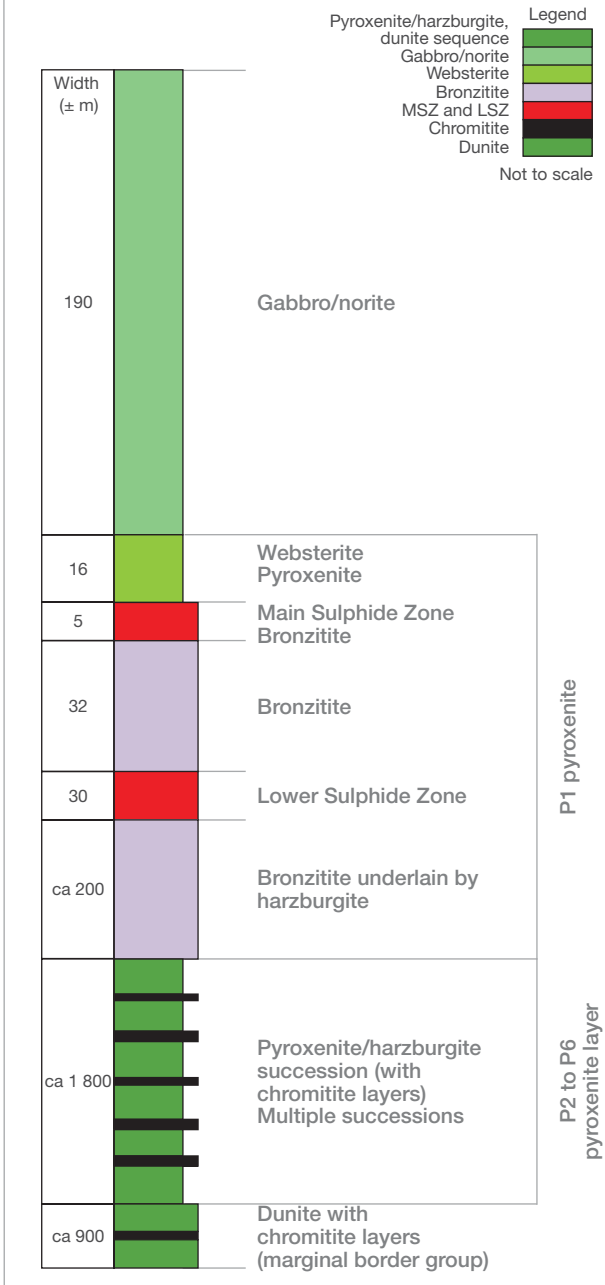
## Mineral Resource estimation and reconciliation

The updated Mineral Resource estimates are tabulated on page 106. The statement reflects the total Mineral Resource estimate for Mimosa as at 30 June 2017. Mineral Resources are quoted inclusive of Mineral Reserves. Mineral Resource estimates allow for estimated geological losses, while no allowance is made for anticipated support pillar losses during eventual mining. Mineral Resource grades are quoted *in situ*. The Mineral Resource estimates have been done using Surpac™ software to apply inverse distance techniques. Current Mineral Resource estimates have included recent drilling and assay results.

No Inferred Mineral Resources have been converted into Mineral Reserves. Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations. The main change can be attributed to normal mining depletion.

The classification of Mineral Resources at Mimosa is informed by a matrix considering geological complexity and the confidence in the geostatistical estimation. In broad terms confidence is derived from surface borehole spacing and this has the largest weighting on classification of Mineral Resources:

- Borehole spacing less than 250m apart supports Measured Mineral Resources
- Borehole spacing between 250 and 500m supports Indicated Mineral Resources
- Borehole spacing greater than 500m supports Inferred Mineral Resources.




GENERALISED GEOLOGICAL SUCCESSION OF THE GREAT DYKE AT MIMOSA

# Mimosa

## Mimosa Mineral Resources – 100% (inclusive reporting)

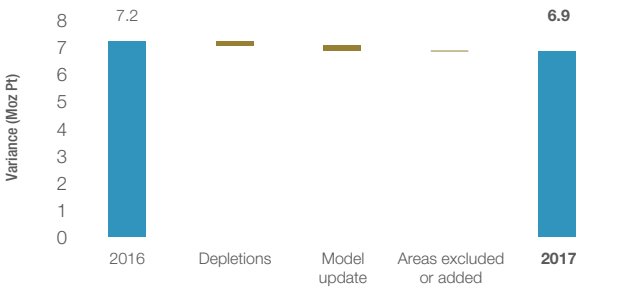
as at 30 June 2017

| as at 30 June 2017 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | South Hill MSZ | | | | North Hill MSZ | | | | Far South Hill MSZ | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| **Tonnes** | Mt | 39.7 | 13.1 | 11.3 | **64.2** | 18.0 | 16.3 | 9.5 | **43.8** | 4.3 | 1.4 | 6.0 | **11.7** | **119.7** |
| **Width** | cm | 200 | 200 | 200 | | 200 | 200 | 200 | | 200 | 200 | 200 | | |
| **4E grade** | g/t | 3.77 | 3.47 | 3.45 | **3.65** | 3.47 | 3.61 | 3.53 | **3.54** | 3.70 | 4.27 | 3.38 | **3.61** | **3.61** |
| **6E grade** | g/t | 4.00 | 3.69 | 3.63 | **3.87** | 3.68 | 3.84 | 3.74 | **3.75** | 3.93 | 4.52 | 3.61 | **3.84** | **3.82** |
| **Ni** | % | 0.14 | 0.14 | 0.14 | **0.14** | 0.14 | 0.16 | 0.14 | **0.15** | 0.14 | 0.15 | 0.13 | **0.14** | **0.14** |
| **Cu** | % | 0.11 | 0.11 | 0.12 | **0.11** | 0.10 | 0.12 | 0.11 | **0.11** | 0.11 | 0.11 | 0.10 | **0.11** | **0.11** |
| **4E oz** | Moz | 4.8 | 1.5 | 1.3 | **7.5** | 2.0 | 1.9 | 1.1 | **5.0** | 0.5 | 0.2 | 0.6 | **1.4** | **13.9** |
| **6E oz** | Moz | 5.1 | 1.6 | 1.3 | **8.0** | 2.1 | 2.0 | 1.1 | **5.3** | 0.5 | 0.2 | 0.7 | **1.4** | **14.7** |
| **Pt oz** | Moz | 2.4 | 0.7 | 0.6 | **3.7** | 1.0 | 0.9 | 0.5 | **2.5** | 0.3 | 0.1 | 0.3 | **0.7** | **6.9** |
| **Pd oz** | Moz | 1.9 | 0.6 | 0.5 | **2.9** | 0.8 | 0.7 | 0.4 | **1.9** | 0.2 | 0.1 | 0.2 | **0.5** | **5.4** |

| as at 30 June 2016 | | | | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | South Hill MSZ | | | | North Hill MSZ | | | | Far South Hill MSZ | | | | |
| | | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Measured | Indicated | Inferred | Total | Total |
| **Tonnes** | Mt | 44.6 | 13.4 | 11.5 | **69.4** | 18.2 | 16.3 | 9.6 | **44.0** | 4.4 | 1.5 | 6.1 | **12.1** | **125.5** |
| **Width** | cm | 200 | 200 | 200 | | 200 | 200 | 200 | | 200 | 200 | 200 | | |
| **4E grade** | g/t | 3.78 | 3.47 | 3.43 | **3.66** | 3.47 | 3.61 | 3.53 | **3.54** | 3.70 | 3.86 | 3.40 | **3.57** | **3.61** |
| **6E grade** | g/t | 4.00 | 3.69 | 3.60 | **3.87** | 3.68 | 3.84 | 3.75 | **3.75** | 3.94 | 4.11 | 3.63 | **3.81** | **3.82** |
| **Ni** | % | 0.14 | 0.14 | 0.14 | **0.14** | 0.14 | 0.16 | 0.14 | **0.15** | 0.14 | 0.15 | 0.13 | **0.14** | **0.14** |
| **Cu** | % | 0.11 | 0.12 | 0.11 | **0.11** | 0.10 | 0.12 | 0.11 | **0.11** | 0.11 | 0.11 | 0.10 | **0.11** | **0.11** |
| **4E oz** | Moz | 5.4 | 1.5 | 1.3 | **8.2** | 2.0 | 1.9 | 1.1 | **5.0** | 0.5 | 0.2 | 0.7 | **1.4** | **14.6** |
| **6E oz** | Moz | 5.7 | 1.6 | 1.3 | **8.6** | 2.1 | 2.0 | 1.2 | **5.3** | 0.6 | 0.2 | 0.7 | **1.5** | **15.4** |
| **Pt oz** | Moz | 2.7 | 0.7 | 0.6 | **4.1** | 1.0 | 0.9 | 0.5 | **2.5** | 0.3 | 0.1 | 0.3 | **0.7** | **7.2** |

The year-on-year comparison of the Mimosa Mineral Resources shows no material change. The reconciliation of the Mineral Resources is impacted by improved software applications which results in an improved assessment in the Mineral Resource area. This model update resulted in a 2% decrease in the Mimosa Mineral Resources. Other variances are related to normal mining depletion and additional data.

### Total Mimosa Mineral Resources



# Mimosa

## Modifying factors

The modifying factors used to convert Mineral Resources to Mineral Reserves are derived from historical performance while taking future anticipated conditions into account. The following modifying factors were applied to the Mineral Resources:

### Key factors and assumptions

| Main Sulphide Zone | Factors |
|---|---|
| Geological losses | 11 – 26% |
| Mineral Resource area | 22 million ca's |
| Pillar factors | 22 – 28% |
| Resource dilution | 8 – 12% |
| Mine call factor | 92 – 96% |
| Relative density | 3.15 – 3.18 |
| Channel width | 200cm |
| Stoping width | 200cm |
| Concentrator recoveries | 78 – 80% |

**Long-term price assumptions in today's money (supporting Mineral Reserve estimates): see pages 5 and 30 for the Implats price assumptions**

| | 6E metal ratio (%) Main Sulphide Zone |
|---|---|
| Platinum | 45.6% |
| Palladium | 35.7% |
| Rhodium | 3.9% |
| Ruthenium | 3.8% |
| Iridium | 3.2% |
| Gold | 7.7% |

| | Implats interest | Mining right (ha) | Prospecting right (ha) |
|---|---|---|---|
| Mimosa | 50% | 6 594 | 0 |

*LHD in operation at Mimosa*

# Mimosa

## Mining methods and mine planning

Mimosa is a shallow underground mine accessed by the Blore Decline Shaft system. The bord and pillar mining method is employed and stoping widths average around 2m. The bord widths vary from 15m, 7m to 6m wide, depending on the ground control district. Minimum pillar sizes are dependent on depth to give a safety factor of greater than 1.6, with pillars being 10m x 3m above 16 level, 10m x 3.5m from 16 level and below, 10m x 4.5m and 4m x 8m in 6m bords in special areas as determined by the ground control districts. The strike pillars in panels are elongated along strike to cater for the predominant east-west faults and dykes and to avoid shear movement down-dip. Mining bords advance along strike. The mining cycle involves mechanised support drilling and installation, mechanised face drilling, charging and blasting and mechanised lashing onto a conveyor network to an underground bunker.

From the bunker ore is conveyed out to a surface stockpile. Optimum stoping widths and mining cut selection are regularly reviewed given variation in metal prices and the non-linear distribution of the different metals. Mining models are defined relative to the platinum peak and recent work confirmed that a 2m slice is presently the optimum cut. The Mineral Resources and Mineral Reserves listed on pages 106 and 109 are based on a slice that extends from 0.45m above the platinum peak datum to 1.55m below the datum. The reported mined grade is based on inverse distance block modelling of borehole values using Surpac™. Mine design and scheduling is done using MineShed™. The mine plan is derived from a target milling throughput. Strategic stockpile levels are factored into the volumes to be hoisted. Losses due to mining and geology are applied to the planned tonnages and then consolidated into the LoM profile. The LoM I depicted overleaf includes on-reef stoping from the Wedza Shaft Mineral Reserve area into the southern part of the South Hill orebody known as the Mtshingwe area. The updated LoM indicates the mine plan, which dictated accelerated mining of the Mtshingwe block, in order to deliver a constant head grade to the mill. Several LoM scenarios are being evaluated at present in order to optimise the orebody.

The LoM graph for Mimosa is shown below. Work is under way to assess various options to optimise the Mineral Resources of Mimosa. The illustration below only reflects the LOM I profile at South Hill. This is a combination of the Wedza and Mtshingwe Mineral Reserves.

## Mineral Reserve estimation and reconciliation

The updated Mineral Reserve estimates are tabulated on page 109. The statement reflects the total Mineral Reserve estimate for Mimosa as at 30 June 2017. Mineral Reserve grades are quoted after applying mine to mill modifying factors. The Mineral Resource estimates have been done using Surpac™ software to apply inverse distance techniques. Current Mineral Reserve estimates have included the latest drilling, assay results, mine design and updated modifying factors.

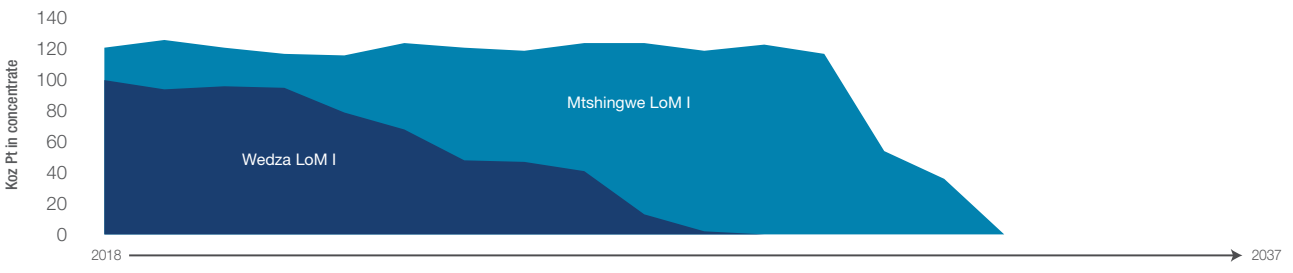
The Mineral Reserves quoted reflect anticipated grades delivered to the mill and estimations are aligned to the business plan by estimating tonnes and grades at 2m mining width. No Inferred Mineral Resources have been converted into Mineral Reserves. The Mineral Reserve Statement as at 30 June 2017 now includes all of the Mtshingwe Shaft area. This conversion was reviewed given the prior project approval, LoM planning and positive economic contribution.

Rounding of numbers may result in minor computational discrepancies. The results tabulated in this report must be read as estimates and not as calculations. The updated pillar design in selected ground district areas impacted on the overall extraction rate.

The conversion and classification of Mineral Reserves at Mimosa is informed by:

- Feasible mine plan and project studies, board approval and available funding
- Economic testing at given market conditions (price deck)
- Indicated Mineral Resources can be classified as Probable Mineral Reserves if the mine plan, approval, funding and economic test is passed
- Measured Mineral Resources can be classified as Proved Mineral Reserves if the mine plan, approval, funding and economic test is passed
- In certain exceptional circumstances the Competent Person may elect to convert Measured Mineral Resources to Probable Mineral Reserves if the confidence in the modifying factors is being confirmed
- No Inferred Mineral Resources are converted to the Mineral Reserve category.

**Mimosa 20-year Pt ounce profile**



# Mimosa

## Mimosa Mineral Reserves – 100%

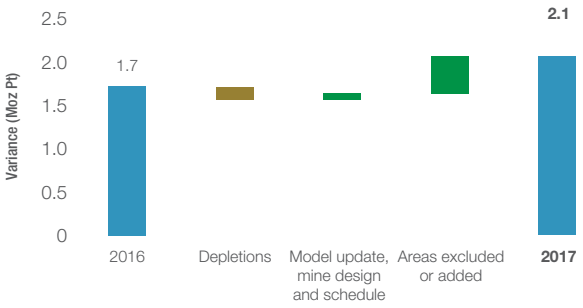
as at 30 June 2017

| as at 30 June 2017 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Orebody category | | South Hill MSZ (Wedza) | | | South Hill MSZ (Mtshingwe) | | | Total |
| | | Proved | Probable | Total | Proved | Probable | Total | |
| **Tonnes** | Mt | 14.0 | 1.6 | **15.5** | 12.1 | 9.7 | **21.8** | **37.3** |
| **Width** | cm | 200 | 200 | | 200 | 200 | | |
| **4E grade** | g/t | 3.44 | 3.27 | **3.42** | 3.66 | 3.38 | **3.54** | **3.49** |
| **6E grade** | g/t | 3.68 | 3.48 | **3.66** | 3.95 | 3.66 | **3.82** | **3.76** |
| **Ni** | % | 0.15 | 0.14 | **0.15** | 0.13 | 0.15 | **0.14** | **0.15** |
| **Cu** | % | 0.11 | 0.11 | **0.11** | 0.10 | 0.12 | **0.11** | **0.11** |
| **4E oz** | Moz | 1.5 | 0.2 | **1.7** | 1.4 | 1.0 | **2.5** | **4.2** |
| **6E oz** | Moz | 1.7 | 0.2 | **1.8** | 1.5 | 1.1 | **2.7** | **4.5** |
| **Pt oz** | Moz | 0.8 | 0.1 | **0.8** | 0.7 | 0.5 | **1.2** | **2.1** |
| **Pd oz** | Moz | 0.6 | 0.1 | **0.7** | 0.5 | 0.4 | **0.9** | **1.6** |

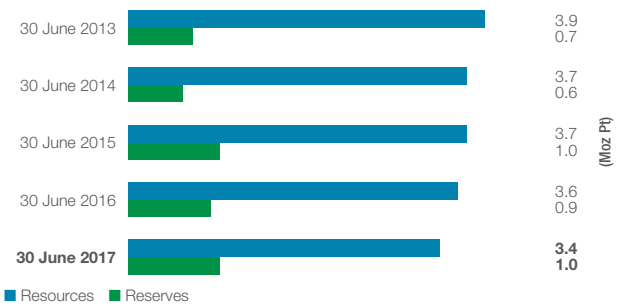
| as at 30 June 2016 | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| Orebody category | | South Hill MSZ (Wedza) | | | South Hill MSZ (Mtshingwe) | | | Total |
| | | Proved | Probable | Total | Proved | Probable | Total | |
| **Tonnes** | Mt | 15.6 | 1.5 | **17.1** | 4.0 | 9.3 | **13.3** | **30.4** |
| **Width** | cm | 200 | 200 | | 200 | 200 | | |
| **4E grade** | g/t | 3.46 | 3.29 | **3.44** | 3.88 | 3.75 | **3.79** | **3.59** |
| **6E grade** | g/t | 3.69 | 3.51 | **3.68** | 4.13 | 4.03 | **4.06** | **3.85** |
| **Ni** | % | 0.16 | 0.14 | **0.15** | 0.14 | 0.13 | **0.13** | **0.15** |
| **Cu** | % | 0.12 | 0.11 | **0.11** | 0.11 | 0.10 | **0.10** | **0.11** |
| **4E oz** | Moz | 1.7 | 0.2 | **1.9** | 0.5 | 1.1 | **1.6** | **3.5** |
| **6E oz** | Moz | 1.9 | 0.2 | **2.0** | 0.5 | 1.2 | **1.7** | **3.8** |
| **Pt oz** | Moz | 0.9 | 0.1 | **0.9** | 0.2 | 0.5 | **0.8** | **1.7** |

The year-on-year comparison indicates that there has been changes since the 30 June 2016 statement. The main change can be attributed to the conversion of the south-western Indicated Mineral Resources of South Hill to probable Mineral Reserves and also the upgrading of some Probable Mineral Reserves to the Proved category. Other changes relate to normal mining depletion.

### Total Mimosa Mineral Reserves

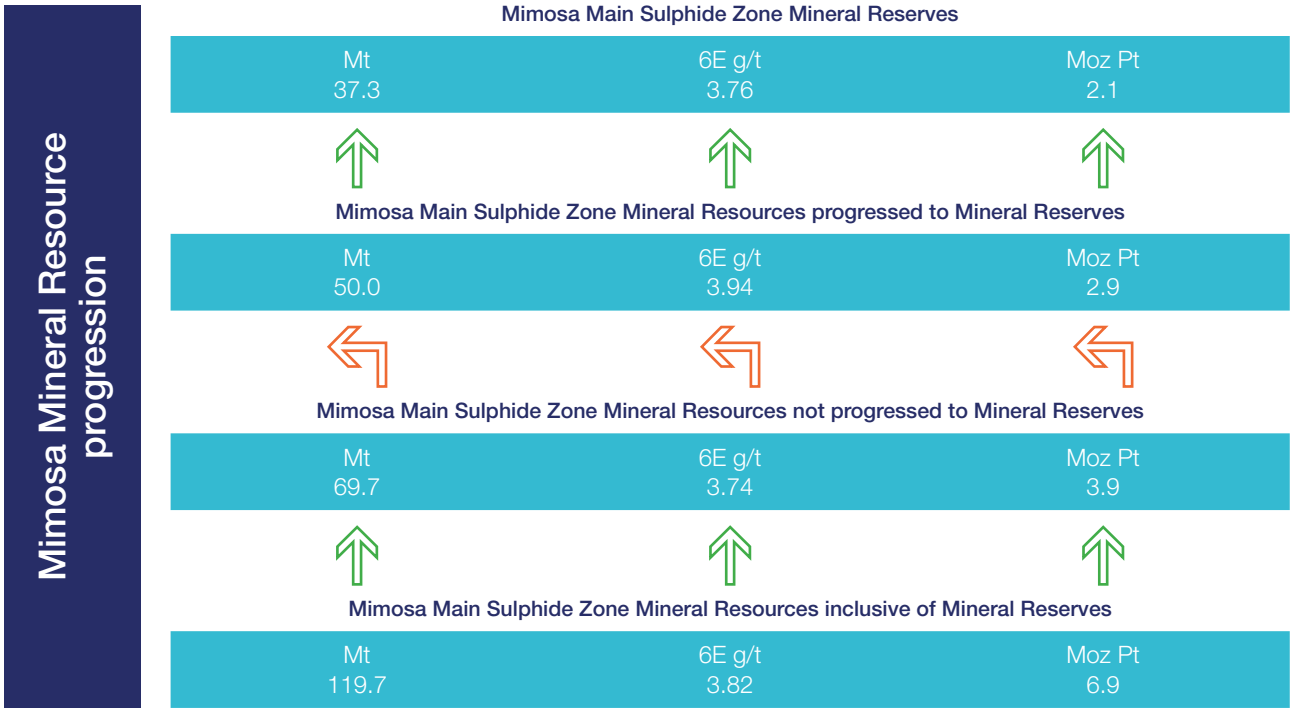



### Mimosa attributable Mineral Resources and Mineral Reserves



# Mimosa

A summary illustration of the progression of Mineral Resources to Mineral Reserves is depicted below, showing the total Mineral Resource estimates ("inclusive" style reporting), those Mineral Resources not progressed to Mineral Reserves ("exclusive" style reporting), the proportion of Mineral Resources that is progressed to Mineral Reserves and the summary Mineral Reserves as derived after modifying factors, including dilution.




## Processing

Mimosa has a concentrator plant on site where initial processing is done. Concentrate is transported by road to Impala Mineral Processes in Rustenburg in terms of an offtake agreement with IRS. An alternative option for local beneficiation is being pursued. A feasibility study is also in progress to investigate the viability to increase output by some 30%.

### Mimosa Mineral Reserve distribution


## Mimosa top risks

The Group risk management process is briefly described on page 14 where the Implats Group top risks are listed. In this context the top risks identified at Mimosa are:

- Sustained depressed PGM basket prices
- A significant deterioration in safety performance
- Excessive taxation and levies
- Failure to progress beneficiation
- Availability of secure and reliable power
- Uncertainty regarding indigenisation policy.

# Mimosa

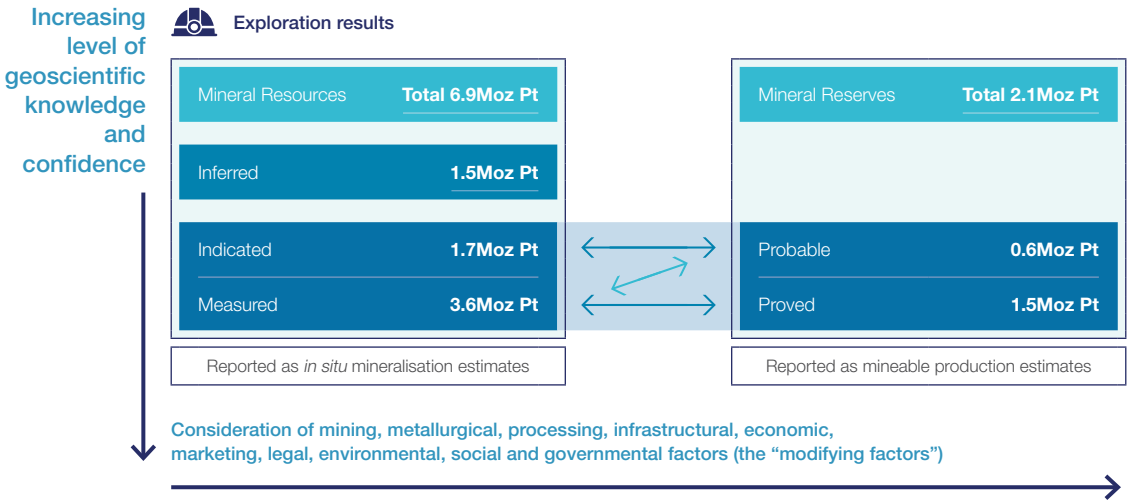
## Valuation

The economic viability of the Mimosa Mineral Reserves is tested by Implats by means of net present value calculations over the LoM of the Mineral Reserve, determining the lowest real rand basket price that would still render the Mineral Reserve viable. This is then tested against the internal Mimosa estimate of the real long-term basket price, the spot price as at 30 June 2017 and a consensus view from various financial institutions. These tests by Implats indicate that the Mimosa operation requires a real long-term basket price of between R27 000 and R29 000 to be economically viable. While the real spot basket price as at 30 June 2017 was R25 600 (US$1 980), the Mimosa internal long-term real basket price is R34 850 (US$2 510) and the equivalent calculated consensus price is R31 360 (US$2 420).

## Compliance

Mimosa has adopted the SAMREC Code for its reporting. The Lead Competent Person for Mimosa's Mineral Resources and Mineral Reserves is Dumisayi Mapundu, a full-time employee of Mimosa. The Lead Competent Person, CertSciNat SACNASP Registration No: 200021/05, has 23 years' relevant experience and Implats has written confirmation from the Lead Competent Person that the information disclosed in terms of these paragraphs are compliant with the SAMREC Code and, where applicable, the relevant Table 1 and JSE Section 12 requirements and that it may be published in the form, format and context in which it was intended. During the past year The Mineral Corporation undertook a review of the Mineral Resources and Mineral Reserves at Mimosa. The audit concluded that there were no fatal flaws identified that would impact materially on the estimates and resultant statement. The audit noted that there was a need at Mimosa for a mine specific code of practice for the estimation and classification of Mineral Resources and the related conversion processes to Mineral Reserves.

**Relationship between exploration results, Mineral Resources and Mineral Reserves (100%)**

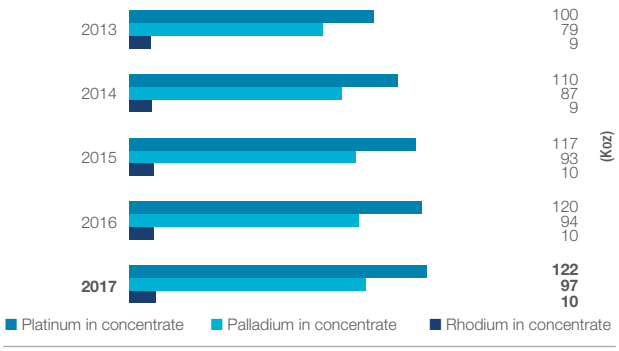


# Mimosa

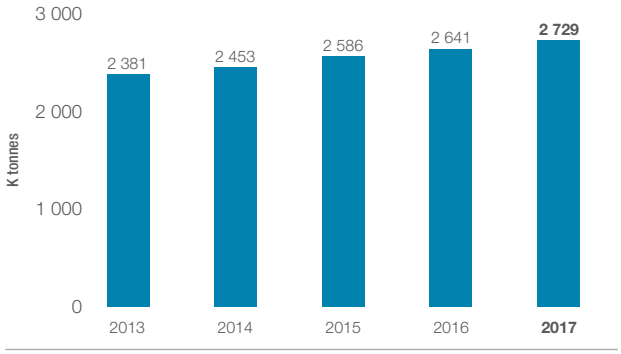
## Key operating statistics

| | | FY2017 | FY2016 | FY2015 | FY2014 | FY2013 |
|---|---|---|---|---|---|---|
| **Production** | | | | | | |
| Tonnes milled ex mine | (000t) | **2 729** | 2 641 | 2 586 | 2 453 | 2 381 |
| Head grade 6E | (g/t) | **3.83** | 3.88 | 3.93 | 3.92 | 3.95 |
| Platinum in concentrate | (000 oz) | **121.6** | 119.7 | 117.4 | 110.2 | 100.3 |
| PGM in concentrate | (000 oz) | **258.9** | 253.7 | 250.1 | 234.6 | 214.8 |
| **Cost of sales** | (Rm) | **(3 341)** | (3 372) | (2 640) | (2 398) | (1 956) |
| On-mine operations | (Rm) | **(1 784)** | (1 764) | (1 375) | (1 425) | (1 110) |
| Concentrating operations | (Rm) | **(581)** | (632) | (501) | (375) | (311) |
| Other | (Rm) | **(976)** | (976) | (764) | (598) | (535) |
| **Total cost** | (Rm) | **2 506** | 2 525 | 2 043 | 1 958 | 1 576 |
| Per tonne milled | (R/t) | **918** | 956 | 790 | 798 | 662 |
| | ($/t) | **67** | 66 | 69 | 77 | 75 |
| Per Pt oz in concentrate | (R/oz) | **20 609** | 21 094 | 17 402 | 17 768 | 15 713 |
| | ($/oz) | **1 511** | 1 463 | 1 525 | 1 713 | 1 782 |
| **Financial ratios** | | | | | | |
| Gross margin ex mine | (%) | **5.2** | (3.3) | 22.9 | 19.3 | 24.2 |
| **Capital expenditure** | (Rm) | **445** | 456 | 343 | 349 | 265 |
| | ($m) | **33** | 32 | 30 | 34 | 30 |

### Mimosa production



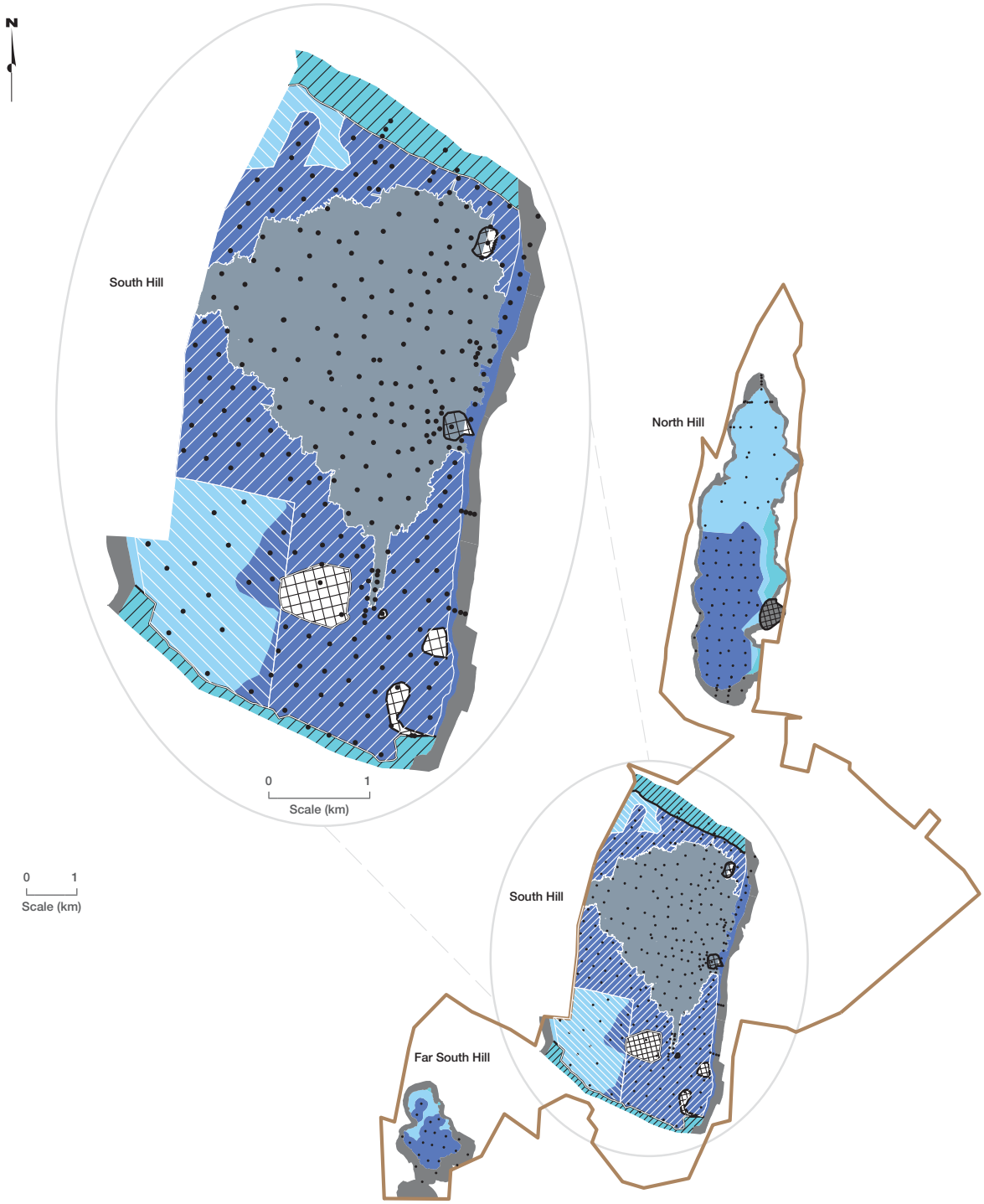

### Tonnes milled




*GPR survey, Mimosa*

# Mimosa

## Mimosa Mineral Resources and Mineral Reserves



# Afplats, Imbasa and Inkosi

**Implats acquired** its interest in the Afplats, Imbasa and Inkosi mineral rights through the acquisition of **African Platinum Plc** in 2007.

## History

Since the dissolution of African Platinum Plc, the Afplats, Imbasa and Inkosi mineral rights are held by Implats together with joint venture partners. The ownership of Afplats comprising the farms Leeuwkop, Kareepoort and Wolvekraal, is jointly owned by Implats (74%) and the Bakwena community (Ba-Mogopa Platinum Investments (Pty) Limited, 26%). The remainder of the Imbasa/Inkosi interest is held by a BEE partner Pfula Investments (Pty) Limited. The Mineral Resources of the three areas are therefore reported separately to reflect this ownership. The extent of the different areas is listed on pages 18 and 116 together with Implats' interest.

In November 2010 the respective boards approved the commencement of a feasibility study at Afplats, with the early work for the pre-sink of the Leeuwkop main shaft commencing on 1 April 2011. This feasibility study was completed in 2011.

During November 2013, a decision was made that another feasibility study be undertaken that would convert the conventional mining layout into a bord and pillar layout. This work was completed by December 2014, by which time the main shaft had been sunk to 1 198m below surface, having traversed the Merensky Reef. The vertical shaft sinking project has been stopped and the Leeuwkop Project has been deferred for five years.

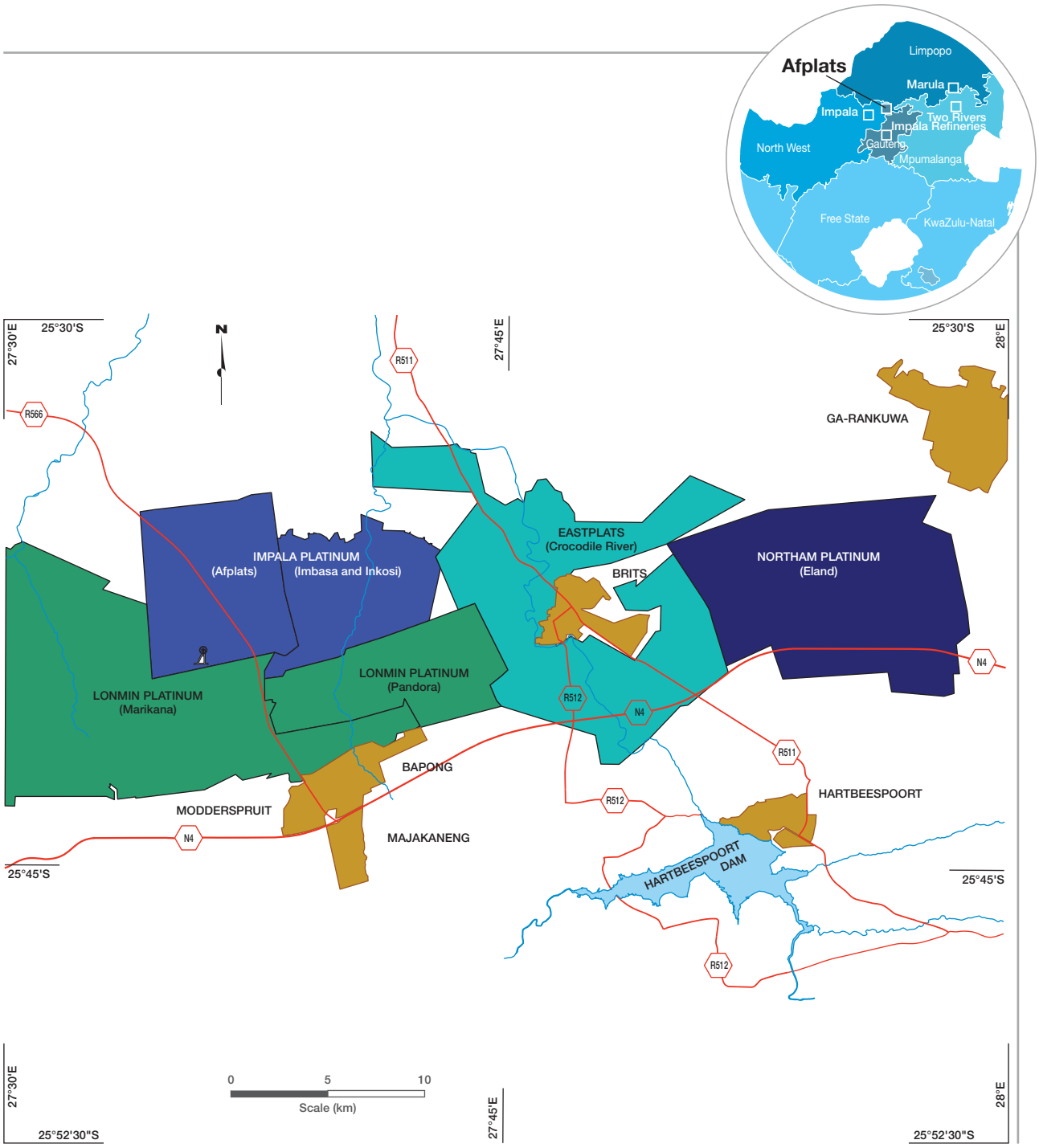
# Afplats, Imbasa and Inkosi

## Location

The Afplats Leeuwkop Mine is located approximately 15km west of the town of Brits in the North West province and some 2km due west of the R566 road to Sun City. The area is bordered to the west and south by Western Platinum, and Eastern Platinum, two of the operations in the Lonmin Group.

The Inkosi and Imbasa prospecting areas are directly adjacent to the Afplats areas and can be reached by the R566 road. The Inkosi and Imbasa areas are bordered to the south by Lonmin's Pandora area and East Platinum's Crocodile River area to the east.

**Regional locality map showing PGM mineral rights and infrastructure at Afplats, Imbasa and Inkosi**



# Afplats, Imbasa and Inkosi

## Mineral rights

Afplats is currently the holder of the Leeuwkop mining right, in respect of the farm Leeuwkop 402JQ to mine PGMs and other base metals and by-products. The new-order mining right was awarded for a 30-year period in 2008. In terms of the MPRDA holders of the mining rights may apply for more than one renewal period of a maximum of 30 years each as per the supporting mining work programme, 60 working days before the relevant expiry date.

Afplats is also the holder of the Kareepoort 407JQ and Wolvekraal 408JQ prospecting right relating to all minerals, excluding dimension stone. The prospecting right was awarded for a five-year period, renewable for a maximum of three more years. The expiry date of the prospecting right was 26 June 2012. The renewal application was manually lodged with the DMR on 23 March 2012. The permit was renewed in February 2016.

An application was lodged on 6 June 2013, under Section 102 of the MPRDA, to amend the Afplats mining right by incorporating the prospecting area into the existing mining right. This application has not yet been executed by the DMR.

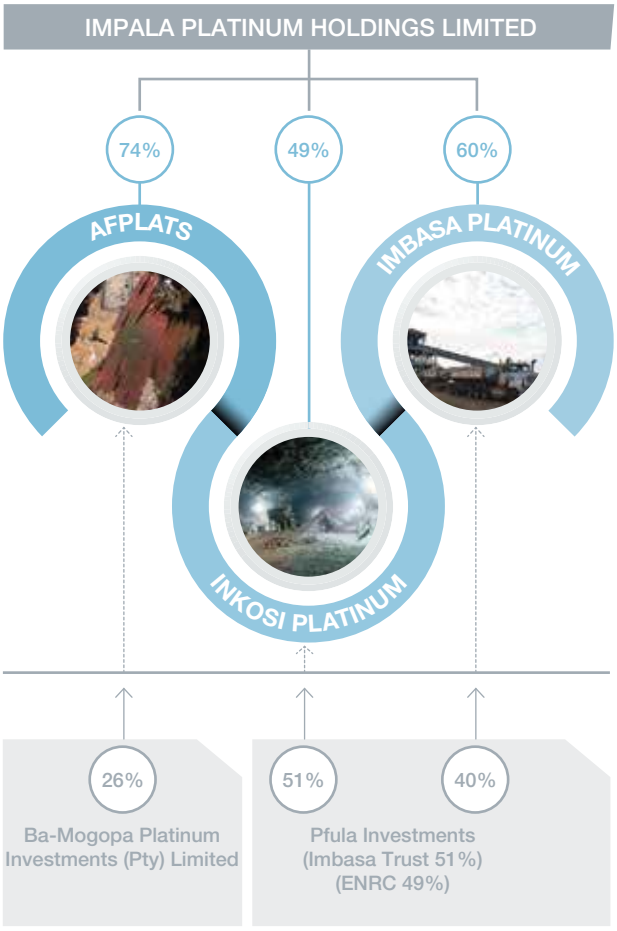
On 15 December 2015 Afplats submitted its detailed Section 52 application in terms of the MPRDA, in which it has advised the Minister of Mineral Resources of the deferment of the Afplats Leeuwkop Mine Project relating to the Afplats Leeuwkop Mining Right.

A converted prospecting right was received on 2 July 2005 by Inkosi Mining (Proprietary) Limited (Inkosi). Inkosi applied for the renewal of this prospecting right for an additional three-year period. The renewal is still pending. An additional 274ha was awarded to Inkosi (known as the Gap area) on 3 February 2009. It expired in February 2012. A renewal was lodged in November 2011 and was executed in February 2015.

The prospecting right of the Imbasa Project was awarded to Imbasa (Pty) Limited (Imbasa) by the DMR on 7 June 2006 for all minerals. Imbasa applied for the renewal of this prospecting right for an additional period of three years. The permit was renewed in February 2016.

| | Mining right (ha) | Pros-pecting right (ha) | Implats' interest (%) |
|---|---|---|---|
| Afplats | 4 602 | 1 065 | 74 |
| Imbasa | | 1 673 | 60 |
| Inkosi | | 2 584 | 49 |

The company structure of Afplats, Imbasa and Inkosi is shown below, illustrating the ownership.



# Afplats, Imbasa and Inkosi

## Infrastructure

Afplats' Leeuwkop Shaft is accessed by a 1.8km tarred road, built by Afplats, from the existing provincial road R556. The current infrastructure includes the shaft sinking headgear and winder houses, electricity supply by Eskom through the Big Horn sub-station, potable water supply from the Madibeng Municipality, exploration core yard, offices and change houses for the sinking contractor and Afplats employees. All infrastructure is in a secured fenced-off area.

The Imbasa and Inkosi projects are being conducted from the Leeuwkop Shaft area and have no separate infrastructure at this stage.

## Environmental

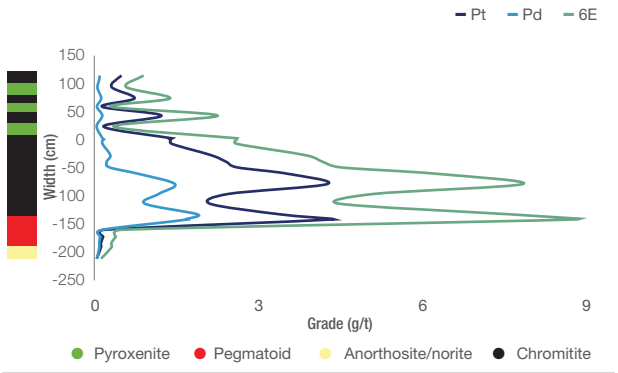
Surface topography, geo-hydrological and environmental study recommendations have been taken into account in positioning the surface infrastructure. The location of known heritage sites have been identified and demarcated. Suitable positions have been identified for the future waste rock disposal area and tailings facility. Detailed drainage arrangements were designed to ensure that the separation of clean and dirty water takes place, as no uncontrolled water run-off is permitted. A noise berm of adequate dimension to the south of the Leeuwkop Shaft has been designed that will minimise noise interference with the local village of Segwaelane some 800m away from the shaft.

## Geology

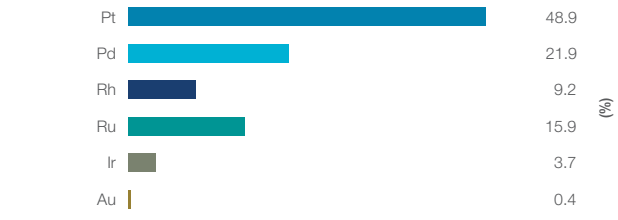
The geological succession at Afplats and surrounding area is illustrated in the accompanying generalised stratigraphic column. The vertical separation between the Merensky and UG2 Reefs averages 200m and both reefs dip northwards at 9°. Both the Merensky and UG2 Reefs have been explored at Afplats, Imbasa and Inkosi, but only the UG2 Reef is currently considered to be economically exploitable. The UG2 Reef comprises a main and upper chromitite layer separated by narrow pyroxenite partings. This will be exploited as a single package. The Merensky Reef is the upper portion of the pyroxenite layer with a very thin chromitite stringer close to the hangingwall contact. Mineralisation peaks over the chromitite stringer and decreases into the footwall. The UG2 Reef occurs about 1 050m below surface at the southern boundary of the farm Leeuwkop. The UG2 Reef consists of two layers of chromitite, separated by thin layers of pyroxenite and is on average 1.35m thick across the Afplats, Imbasa and Inkosi areas. From a mining perspective it would be impractical and dangerous to mine the lower UG2 chromitite layer with a higher grade without the inclusion of the upper UG2 chromitite layer with a lower grade. The two UG2 chromitite layers were combined in the grade estimation and reported as the Mineral Resource width.

The Reefs may be disrupted by minor and major faults, dolerite dykes, late stage ultramafic replacement pegmatoid bodies and potholes.

**Afplats – UG2**

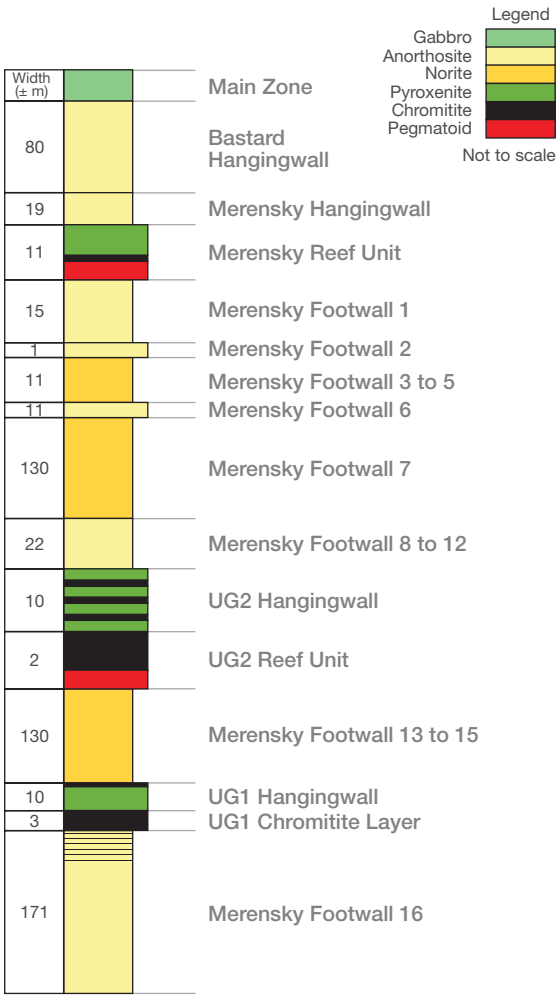



**Afplats, Imbasa and Inkosi UG2 6E metal ratio**




*Borehole core at Afplats*

# Afplats, Imbasa and Inkosi




GENERALISED GEOLOGICAL SUCCESSION OF THE UPPER PORTION OF THE CRITICAL ZONE: AFPLATS

## Mineral Resource estimation and reconciliation

No additional data was added to the Mineral Resource estimation and there is therefore no change to the previous statement. The following notes should be read in conjunction with the Mineral Resource table.

The Mineral Resource Statement as at 30 June 2017 reflects the total estimate for the Afplats, Imbasa and Inkosi areas. The attributable Mineral Resources are reported in the summary sections. Implats has chosen not to publish the Merensky Reef Mineral Resource estimates as the eventual economic extraction is presently in doubt. The previous depth cut-off of 2 350m below surface for Mineral Resources was reviewed during 2014 and was updated to reflect a 2 000m below surface cut-off. The eventual economic extraction of certain Mineral Resources below current and planned infrastructure is in doubt. These were excluded from the main Mineral Resource estimates. This impacted only on Inferred Mineral Resources and these areas are indicated in the accompanying map.

The estimate has been conducted using the Isatis™ software. A multi-pass search was used for the estimation and capping of extreme values was applied for UG2 Reef data. Estimated losses have been accounted for in the Mineral Resource calculation varying from 22% to 27%, using the geological model, constructed in CADSmine™ software as the basis.

There is no change in the UG2 Reef Mineral Resource estimate since the previous statement. The Mineral Resources are reflected in both 4E and 6E formats. Rounding of numbers may result in minor computational discrepancies. Mineral Resource estimates are inherently imprecise in nature. The results tabulated in this report must be read as estimates and not as calculations. Inferred Mineral Resources in particular are qualified as approximations.

All the known geological losses are discounted from the Mineral Resources and a factor for the unknown geological losses is applied to the remainder of the areas. The global extraction rate for Afplats is 78% and for the Imbasa and Inkosi area 73%.

# Afplats, Imbasa and Inkosi

## Afplats, Imbasa and Inkosi Mineral Resources (100%)

as at 30 June 2017

| as at 30 June 2017 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Afplats UG2 | | | | Imbasa UG2 | | | Inkosi UG2 | | | |
| | | Measured | Indicated | Inferred | Total | Indicated | Inferred | Total | Indicated | Inferred | Total | Total |
| **Tonnes** | Mt | 98.4 | 10.8 | 55.9 | **165.1** | 28.2 | 40.2 | **68.4** | 67.9 | 38.4 | **106.3** | **339.8** |
| **Width** | cm | 133 | 136 | 129 | | 137 | 144 | | 135 | 142 | | |
| **4E grade** | g/t | 5.19 | 5.11 | 5.06 | **5.14** | 4.59 | 4.53 | **4.56** | 4.87 | 4.64 | **4.79** | **4.91** |
| **6E grade** | g/t | 6.47 | 6.36 | 6.25 | **6.39** | 5.74 | 5.70 | **5.72** | 6.14 | 5.88 | **6.05** | **6.15** |
| **Ni** | % | 0.03 | 0.03 | 0.03 | **0.03** | 0.03 | 0.03 | **0.03** | 0.03 | 0.03 | **0.03** | **0.03** |
| **Cu** | % | 0.01 | 0.01 | 0.01 | **0.01** | 0.01 | 0.01 | **0.01** | 0.01 | 0.01 | **0.01** | **0.01** |
| **4E oz** | Moz | 16.4 | 1.8 | 9.1 | **27.3** | 4.2 | 5.9 | **10.0** | 10.6 | 5.7 | **16.4** | **53.7** |
| **6E oz** | Moz | 20.5 | 2.2 | 11.2 | **33.9** | 5.2 | 7.4 | **12.6** | 13.4 | 7.3 | **20.7** | **67.1** |
| **Pt oz** | Moz | 10.0 | 1.1 | 5.5 | **16.6** | 2.6 | 3.6 | **6.2** | 6.6 | 3.6 | **10.1** | **32.8** |
| **Pd oz** | Moz | 4.5 | 0.5 | 2.5 | **7.4** | 1.1 | 1.6 | **2.8** | 2.9 | 1.6 | **4.5** | **14.7** |

| as at 30 June 2016 | | | | | | | | | | | |
|---|---|---|---|---|---|---|---|---|---|---|---|
| Orebody category | | Afplats UG2 | | | | Imbasa UG2 | | | Inkosi UG2 | | | |
| | | Measured | Indicated | Inferred | Total | Indicated | Inferred | Total | Indicated | Inferred | Total | Total |
| **Tonnes** | Mt | 98.4 | 10.8 | 55.9 | **165.1** | 28.2 | 40.2 | **68.4** | 67.9 | 38.4 | **106.3** | **339.8** |
| **Width** | cm | 133 | 136 | 129 | | 137 | 144 | | 135 | 142 | | |
| **4E grade** | g/t | 5.19 | 5.11 | 5.06 | **5.14** | 4.59 | 4.53 | **4.56** | 4.87 | 4.64 | **4.74** | **4.91** |
| **6E grade** | g/t | 6.47 | 6.36 | 6.25 | **6.39** | 5.74 | 5.70 | **5.72** | 6.14 | 5.88 | **5.99** | **6.15** |
| **Ni** | % | 0.03 | 0.03 | 0.03 | **0.03** | 0.03 | 0.03 | **0.03** | 0.03 | 0.03 | **0.03** | **0.03** |
| **Cu** | % | 0.01 | 0.01 | 0.01 | **0.01** | 0.01 | 0.01 | **0.01** | 0.01 | 0.01 | **0.01** | **0.01** |
| **4E oz** | Moz | 16.4 | 1.8 | 9.1 | **27.3** | 4.2 | 5.9 | **10.0** | 10.6 | 5.7 | **16.4** | **53.7** |
| **6E oz** | Moz | 20.5 | 2.2 | 11.2 | **33.9** | 5.2 | 7.4 | **12.6** | 13.4 | 7.3 | **20.7** | **67.1** |
| **Pt oz** | Moz | 10.0 | 1.1 | 5.5 | **16.6** | 2.6 | 3.6 | **6.2** | 6.6 | 3.6 | **10.1** | **32.8** |

*Exploration drilling at Impala*

# Afplats, Imbasa and Inkosi

## Mining methods and mine planning

A feasibility study for the Leeuwkop Shaft was completed in 2011, based on a conventional mining method layout. This feasibility study was approved by the Implats board. During November 2013, a decision was made that another feasibility study be undertaken that would convert the conventional mining layout into a mechanised bord and pillar layout. The mine planning was completed in a 3D spatial environment and the shaft sinking layout was updated to suit the mining method. This work was completed in December 2014, but not approved by the board. The Mineral Resource has therefore not been progressed to the Mineral Reserve category pending the full project approval and funding in accordance with Implats' practice. The feasibility study area represents 42% of the Afplats Mineral Resource area.

The vertical shaft sinking project has been stopped and the project was placed on care and maintenance in February 2015. The Leeuwkop Project has been deferred for five years. By December 2014, the main shaft has progressed to a depth of 1 198m below surface, some 16m above the first station level with the main station level planned at 1 274m and the shaft bottom position designed at 1 396m below surface.

A pre-feasibility study for Imbasa and Inkosi, based on a conventional mining method, was completed in January 2014. Based on the work completed at Afplats' Leeuwkop Project for a bord and pillar mining layout, it was decided that a desktop study be completed during the 2015 financial year for the Imbasa and Inkosi area to compare four different mining methods. This work was completed by November 2015. Mechanised mining options were found more favourable than the conventional mining layout.

The indicative LoM profile for the Leeuwkop Project is included in the Impala discussion. This is under review given the present cash constraints and the consideration of a mechanised mining layout.

## Compliance

Implats is committed to independent third-party reviews of Mineral Resource and Mineral Reserve estimates. These reviews, which provide assurance and assist with the principle of continuous improvement, are undertaken on a two-year cycle. Implats commissioned The Mineral Corporation to complete an audit of the Mineral Resources and Reserves (the Audit) for its platinum group metal (PGM) operations.

The SAMREC Table 1 report for Afplats was reviewed within the context defined by Implats. The Mineral Corporation noted that there were no material flaws in the overall content of the reports. It is The Mineral Corporation's opinion that sufficient content relating to the estimation and reporting of Mineral Resources has been provided in the report.

The Lead Competent Person for Afplats is Jacolene de Klerk, a full-time employee of Impala. The Competent Person, PrSciNat SACNASP Registration No: 400085/10, has 12 years' relevant experience.

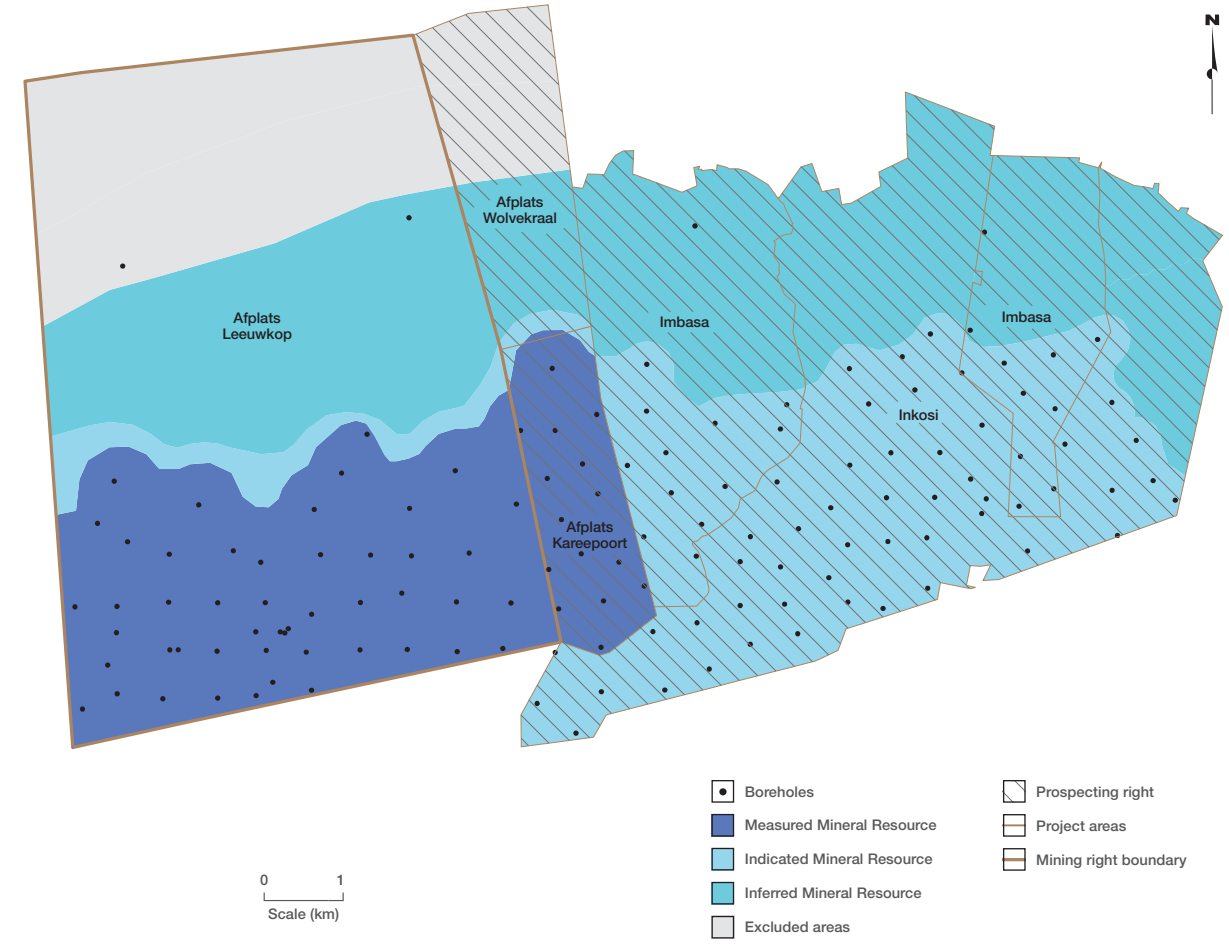
Implats has written confirmation from the Lead Competent Person that the information disclosed in terms of these paragraphs is compliant with the SAMREC Code and, where applicable, the relevant SAMREC Table 1 and JSE Section 12 requirements, and that it may be published in the form, format and context in which it was intended.

### Total Afplats, Imbasa and Inkosi Mineral Resources


### Afplats attributable Mineral Resources

# Afplats, Imbasa and Inkosi

## Afplats, Imbasa and Inkosi UG2 Mineral Resources



# Chromium ore at Implats

The world chromium ore production originates from the mineral chromite (a chromium-iron oxide) in the rock or ore called chromitite. The majority of the chromium Mineral Resources of the world are to be found in the Bushveld Complex of South Africa and the Great Dyke of Zimbabwe, where it occurs as numerous thin and laterally contiguous stratiform chromitite layers, interlayered with mafic and ultramafic rocks.

Up to 11 chromitite layers are known in the Great Dyke, named from the top down as Seams 1 to 11. Thirteen chromitite layers are known in the Bushveld Complex, which are further clustered into three groups, the lower, middle and upper groups of chromitite layers. Named from the bottom up, they are termed LG1 to LG7, MG1 to MG4, and the UG1 and UG2. In places, individual chromitite layers may comprise multiple layers of subsidiary chromitite units, separated by intercalated silicate units.

Although some of the chromitite layers have been known since 1865, limited mining only commenced in 1916 in the Bushveld Complex and in 1919 on the Great Dyke. The use and mining of chromium escalated after the conclusion of the Second World War. About half of the total world chromium ore production is mined from the Bushveld Complex.

In the Bushveld Complex, only the LG6, MG1 and UG2 chromitite layers are amenable to underground mining. The uppermost chromitite layer (UG2) is between 50m and 400m below the Merensky Reef and hosts economically exploitable quantities of PGMs within the chromitite. The UG2 chromitite layer is therefore mined at all the Implats operations, principally for the PGMs. Chromium can therefore be seen as a by-product of the UG2 Reef in South Africa. The LG6 and MG1, with an average $Cr_2O_3$ grade of between 40% and 50%, is more than 250m below the UG2 Reef. They can therefore not be mined from the existing infrastructure at the Implats operations and are mined by other operators close to surface in opencast and underground mining operations for the chromium content only.

The UG2 Reef at **Impala** has an average *in situ* $Cr_2O_3$ grade of about 33%, and a mined grade of about 16%. The mined ore from the UG2 Reef is milled and processed to recover the PGMs at the mine's two PGM concentrator plants. The tailings from the central concentrator is pumped directly to the tailings dams, as this is predominantly Merensky Reef tailings. Some of the tailings generated by the UG2 PGM recovery plant is reprocessed at two metallurgical plants to recover the chromite. Impala has an off-take agreement with Merafe Resources and annually sells approximately 220kt of chromite concentrate recovered at one of the chromite recovery plants. The second chromite recovery plant which is owned by Impala Chrome was commissioned in 2010 and is operated by Chrome Traders (Pty) Limited. Currently about 230kt of chromite is reprocessed per annum by Chrome Traders and the remainder is pumped to the tailings dams. The retrieved chromite from the UG2 tailings has an average $Cr_2O_3$ grade of about 42%. The number 3 and number 4 tailings dams at Impala currently contain about 500Mt of milled and processed ore, with an average $Cr_2O_3$ grade of less than 8%.

At the **Marula Mine**, ore from the UG2 Reef is milled and processed to retrieve the PGMs at the PGM recovery plant of the mine. The Makgomo chrome recovery plant subsequently reprocesses the UG2 tailings generated by the PGM recovery plant to extract the chromitite. The plant has been operating since 2010. Owned by Makgomo Chrome (Pty) Limited, the plant is operated by Chrome Traders, that has an off-take agreement whereby all of the chromite concentrate produced is purchased on a free carrier basis from the plant. Makgomo Chrome is 50% owned by the Marula Community Chrome (Pty) Limited, 30% by Implats and 20% by Marula Platinum Mine. In recent years some 150kt of chromite concentrate is produced per annum and the remainder is pumped to the tailings dams. During the past year the production at the chrome plant was interrupted in order to resolve disputes between different community stakeholders; at the time of compiling this report the plant remains closed. The *in situ* grade of the UG2 chromitite layer at Marula has not been determined, but the chromite concentrate has an average $Cr_2O_3$ grade of about 42%. The tailings dam at Marula currently contains about 15.7 million tonnes of milled and processed UG2 ore at an average $Cr_2O_3$ grade of about 12%.

At the **Two Rivers Platinum Mine**, ore from the UG2 Reef is milled and processed to recover the PGMs at the mine's MF2 PGM concentrator. The chromite recovery plant then reprocesses the UG2 tailings generated by the concentrator to recover the chromite. The chromite recovery plant was commissioned in 2013. The plant is owned and operated by Two Rivers, which also has an off-take agreement with Chrome Traders whereby all of the concentrate produced is purchased on a free carrier basis from Two Rivers. Currently about 240kt per annum of chromite is produced at a $Cr_2O_3$ grade of 41.5%, and a silica content of less than 3%, and the remainder is pumped to the tailings dams. The UG2 tailings at Two Rivers that have been reprocessed have an average $Cr_2O_3$ grade of about 15%. The tailings dams at Two Rivers currently contain about 24 million tonnes of milled and processed ore with an average $Cr_2O_3$ grade of about 17%.

No mining has taken place at **Afplats, Imbasa and Inkosi.** The UG2 Reef in this area has an average *in situ* $Cr_2O_3$ grade of about 31%.

At **Zimplats** the uppermost chromitite layer (Seam 1) is about 220m below the MSZ. It can therefore not be mined from the existing infrastructure and is mined by other operators and artisanal miners close to surface for its chromium content only. This is also the case at Mimosa.

The available information is currently not sufficient to support a comprehensive Mineral Resource or Mineral Reserve Statement for the chromium ore production by Implats.

# Areas excluded from Mineral Resource estimates

## Implats introduced a depth cut-off in 2010 whereby mineralisation below a certain depth is excluded from the Mineral Resource estimate.

This depth cut-off is applicable to the Bushveld Complex setting and is reviewed annually considering a range of assumptions, specifically the virgin rock temperature (VRT), cooling requirements, available technology, support design and other cost, prices and mining depth limits presently in the platinum industry. It is recognised that while the actual depth cut-off could vary from area to area and over time as conditions vary, a constant depth is assumed for all operations at present. The depth cut-off of 2 350m was applied during the 2013 Implats Mineral Resource estimates and equated approximately to a VRT of 73°C. The depth cut-off was effectively set at 2 000m below surface in 2014. Additional to the depth cut-off areas, various Mineral Resource blocks are considered on a case-by-case basis. Effectively all mineralisation deeper than 2 000m below surface has now been excluded from the Mineral Resource Statements, as well as other areas where the eventual economic extraction is in doubt.

In order to avoid confusion, these areas are not reported with the Mineral Resources but separately in this section. For further clarity, note that these are excluded from the summation of total Mineral Resources per area and the attributable Mineral Resources. These areas are also indicated as excluded areas on the Mineral Resource maps per operation.

The indicative quantum of such excluded areas is as follows:

- At Impala the estimate for the areas underlain by the Merensky and UG2 Reefs that are excluded in the Mineral Resource estimates is in the order of some 29Moz Pt. More than 60% of these areas occur at depths greater than 2 350m below surface
- The Hackney farm portion at Marula is excluded from the Mineral Resource estimate given the unlikely eventual economic extraction. The indicative quantum of the excluded area is 0.9Moz Pt
- At Afplats all of the Merensky Reef is excluded from the Mineral Resource estimates given the unlikely eventual economic extraction. In addition, there are areas where the UG2 Reef occurs at depths deeper than 2 000m and these are excluded in the Mineral Resource estimates listed in the Afplats section. The indicative quantum of such excluded areas is in the order of some 22Moz Pt for the UG2 Reef and Merensky Reef
- At Two Rivers, an area west of the major fault on the farms Kalkfontein and Buffelshoek is excluded from the Mineral Resource estimate. The indicative quantum of such excluded areas is in the order of some 9Moz Pt in total for the Merensky and UG2 Reefs
- At Zimplats, areas which are excluded from the Mineral Resource estimates are indicated on the Mineral Resource maps. These are mostly low grade areas and the quantum of these is not material in comparison with the total estimate for Zimplats.

*Geologists logging core*

# Glossary of terms

| | |
|---|---|
| **4E (equivalent to 3PGE+Au)** | Refers to the sum of platinum, palladium, rhodium and gold content as determined by a nickel sulphide collection fire assay procedure; this is considered to be the most accurate assay procedure, and results can usually be compared between laboratories. |
| **6E (equivalent to 5PGE+Au)** | Refers to the sum of platinum, palladium, rhodium, ruthenium, iridium and gold content as determined by a nickel sulphide collection fire assay procedure; this is considered to be the most accurate assay procedure, and results can usually be compared between laboratories. |
| **AA** | Atomic absorption spectroscopy is an analytical technique which uses the absorption of light to measure the concentration of elements. |
| **Afplats** | Afplats Proprietary Limited. |
| **Anorthosite** | Igneous rock composed almost entirely of plagioclase feldspar. |
| **ARM** | African Rainbow Minerals Limited of which ARM Platinum is a subsidiary. |
| **ASX** | Australian Securities Exchange. |
| **AusIMM** | Australasian Institute of Mining and Metallurgy. |
| **BEE** | Black economic empowerment. |
| **Bord and pillar** | Underground mining method where ore is extracted from rectangular shaped rooms, leaving parts of the ore as pillars to support the roof. Pillars are usually rectangular and arranged in a regular pattern. |
| **Bronzitite** | Igneous rock composed mainly of orthopyroxene. |
| **Concentrating** | A process of splitting the milled ore in two fractions, the smaller fraction containing the valuable minerals, the rest waste. |
| **Chromitite** | A rock composed mainly of the mineral chromite. |
| **CIMA** | Chartered Institute of Management Accountants. |
| **Decline** | A shallow dipping mining excavation used to access the orebody. |
| **Development** | Underground excavations for the purpose of accessing Mineral Reserves. |
| **DMR** | Department of Mineral Resources, formerly known as the Department of Minerals and Energy (DME). |
| **Diorite** | Igneous rock composed of amphibole, plagioclase feldspar, pyroxene and small amounts of quartz. |
| **Dunite** | Igneous rock consisting mainly of olivine. |
| **Dyke** | A wall-like body of igneous rock that intruded (usually vertically) into the surrounding rock in such a way that it cuts across the stratification (layering) of this rock. |
| **ECSA** | Engineering Council of South Africa: The Engineering Profession Act, 2000 (Act No 46 of 2000), was promulgated in 2000; the Act became effective in 2011. In terms of Section 18(1), the Act empowers ECSA to register persons in certain prescribed Categories of Registration. Paragraph 9 of the SAMREC Code refers to ECSA: A 'Competent Person' is a person who is registered with SACNASP, ECSA or SAGC, or is a Member or Fellow of the SAIMM, the GSSA or a Recognised Overseas Professional Organisation (ROPO). |
| **EPO** | Exclusive prospecting order (Zimbabwe). |
| **Felsic rock** | An igneous rock composed mainly of a light-coloured mineral, like feldspar (or plagioclase) and usually quartz, which are more than 60% by volume. |
| **Gabbro** | Igneous rock composed mainly and approximately equally of plagioclase feldspar and clinopyroxene. |
| **g/t** | Grams per metric tonne. The unit of measurement of metal content or grade, equivalent to parts per million. |
| **GSSA** | Geological Society of South Africa. |
| **ha** | Abbreviation for hectare, unit of area measured equal to 10 000 square metres. |

# Glossary of terms

| | |
|---|---|
| **Harzburgite** | Igneous rock composed mainly of olivine and pyroxene. |
| **ICP-MS** | Inductively coupled plasma mass spectrometry is a type of mass spectrometry which is capable of detecting metals at low levels. This is achieved by ionizing the sample with inductively coupled plasma and then using a mass spectrometer to separate and quantify those ions. |
| **IMSSA** | Institute of Mine Surveyors of Southern Africa. |
| **In situ** | In its natural position or place. |
| **IRS** | Impala Refining Services Limited. |
| **JORC Code** | The 2004 Australasian Code for Reporting of Mineral Resources and Ore Reserves. This was updated and reissued as the JORC Code 2012. |
| **JSE** | JSE Limited, the South African securities exchange based in Johannesburg. Formerly the JSE Securities Exchange and prior to that the Johannesburg Stock Exchange. |
| **JV** | Joint venture. |
| **Kriging** | A geostatistical estimation method that gives the best-unbiased linear estimates of point values or of block averages. |
| **LoM** | Life-of-mine. |
| **Mafic** | An igneous rock composed mainly of dark ferromagnesium minerals, which are less than 90% by volume. |
| **Merensky Reef** | A horizon in the Critical Zone of the Bushveld Complex often containing economic grades of PGM and associated base metals. The “Merensky Reef”, as it is generally used, refers to that part of the Merensky unit that is economically exploitable, regardless of the rock type. |
| **Mill grade** | The value, usually expressed in parts per million or gram per tonne, of the contained material delivered to the mill. |
| **Moz** | Million ounces. All references to ounces are troy ounces with the factor being 31.10348 metric grams per ounce. |
| **MPRDA** | Minerals and Petroleum Resources Development Act of South Africa. |
| **MSZ** | The Main Sulphide Zone (MSZ) is the PGM-bearing horizon hosted by the Great Dyke. In addition to the economically exploitable PGMs there is associated base metal mineralisation. The MSZ is located 10m to 50m below the ultramafic/mafic contact in the P1 pyroxenite. |
| **Mt** | Abbreviation for million metric tonnes. |
| **Norite** | Igneous rock composed mainly of plagioclase feldspar and orthopyroxenes in approximately equal proportions. |
| **Pegmatoid** | An igneous rock that has the coarse-crystalline texture of a pegmatite but lacks graphic intergrowths. |
| **PGE** | Platinum group elements comprising the six elemental metals of the platinum group. The metals are platinum, palladium, rhodium, ruthenium, iridium and osmium. |
| **PGM** | Platinum group metals being the metals derived from PGE. |
| **Pyroxenite** | Igneous rock composed mainly of pyroxene and minor feldspar. |
| **QAQC** | Quality Assurance and Quality Control. |
| **RBR** | Royal Bafokeng Resources. |
| **Reef** | A local term for a tabular metalliferous mineral deposit. |

# Glossary of terms

| | |
|---|---|
| **RPO** | Recognised Professional Organisation. |
| **SACNASP** | South African Council for Natural Scientific Professions: The Natural Sciences Profession Act, 2003 (Act No 27 of 2003), was approved in 2003. The Act empowers SACNASP to register persons in certain prescribed categories of registration. Paragraph 9 of the SAMREC Code refers to SACNASP: "A 'Competent Person' is a person who is registered with SACNASP, ECSA or SAGC, or is a Member or Fellow of the SAIMM, the GSSA or a Recognised Overseas Professional Organisation (ROPO)." |
| **SAICA** | South African Institute of Chartered Accountants. |
| **SAGC** | South African Geomatics Council. |
| **SAIMM** | Southern African Institute of Mining and Metallurgy. |
| **SAMREC** | The South African Mineral Resource Committee. |
| **SAMREC Code** | The South African Code for the Reporting of Exploration Results, Mineral Resources and Mineral Reserves. |
| **SAMVAL Code** | The South African Code for the reporting of Mineral Asset Valuation. |
| **Section 11** | Section 11 of the MPRDA provides that the Minister's written consent is required for the cession, transfer or sale of a right, or an interest in such right, as well as the sale of a controlling interest in an unlisted company or close corporation. |
| **Section 52** | Section 52 of the MPRDA provides that the holder of a mining right must, after consultation with applicable trade unions, inform the Minerals and Mining Development Board if any mining operation is to be curtailed or to cease with the likely consequence being that 10% or more of the workforce or more than 500 employees, are likely to be retrenched in any 12-month period. |
| **Section 102** | Section 102 of the MPRDA provides that a right may not be amended or varied without the written consent of the Minister. This includes the mining work programme, environmental management programme, extension of the area or addition of minerals or seams. |
| **Seismic surveys** | A geophysical exploration method whereby rock layers can be mapped based on the time taken for wave energy reflected from these layers to return to surface. |
| **Smelting** | A pyrometallurgical process to further upgrade the fraction containing valuable minerals. |
| **SSC** | SAMREC/SAMVAL Committee. |
| **Stoping** | Underground excavations to effect the removal of ore. |
| **UG2 Reef** | A distinct chromitite horizon in the Upper Critical Zone of the Bushveld Complex usually containing economic grades of PGE and limited associated base metals. |
| **Ultramafic rock** | An igneous rock composed mainly of dark ferromagnesium minerals, which are more than 90% by volume. |
| **Websterite** | Igneous rock composed almost entirely of clino- and orthopyroxene. |

# Mineral Resource and Mineral Reserve definitions

**SAMREC Code** – The Code sets out a required minimum standard for the Public Reporting of Exploration Results, Mineral Resources and Mineral Reserves. References in the Code to Public Report or Public Reporting pertain to those reports detailing exploration results, Mineral Resources and Mineral Reserves and which are prepared as information for investors or potential investors and their advisers. SAMREC was established in 1998 and is modelled on the Australasian Code for reporting of Mineral Resources and Ore Reserves (JORC Code). The first version of the SAMREC Code was issued in March 2000 and adopted by the JSE in its Listings Requirements later that same year. The Code has been adopted by the SAIMM, GSSA, SACNASP, ECSA, IMSSA and SAGC, and it is binding on members of these organisations.

For background information and the history of the development of the Code, please refer to the SAMREC Code, March 2000.

A second edition of the SAMREC Code was issued in 2007 with an amendment being issued in 2009 and the latest edition was released in May 2016, this supersedes the previous editions of the Code.

A **'Competent Person'** (CP) is a person who is registered with SACNASP, ECSA or SAGC, or is a Member or Fellow of the SAIMM, the GSSA, IMSSA or a Recognised Professional Organisation (RPO). These organisations have enforceable disciplinary processes including the powers to suspend or expel a member. A complete list of recognised organisations will be promulgated by the SAMREC/SAMVAL Committee (SSC) from time to time. The Competent Person must comply with the provisions of the relevant promulgated Acts. A Competent Person must have a minimum of five years' relevant experience in the style of mineralisation or type of deposit under consideration and in the activity which that person is undertaking. If the Competent Person is estimating or supervising the estimation of Mineral Resources, the relevant experience must be in the estimation, assessment and evaluation of Mineral Resources. If the Competent Person is estimating, or supervising the estimation of Mineral Reserves, the relevant experience must be in the estimation, assessment, evaluation and assessment of the economic extraction of Mineral Reserves. Persons being called upon to sign as a Competent Person must be clearly satisfied in their own minds that they are able to face their peers and demonstrate competence in the commodity, type of deposit and situation under consideration.

A **'Mineral Resource'** is a concentration or occurrence of solid material of economic interest in or on the earth's crust in such form, grade or quality and quantity that there are reasonable prospects for eventual economic extraction. The location, quantity, grade, continuity and other geological characteristics of a Mineral Resource are known, estimated or interpreted from specific geological evidence and knowledge, including sampling. Mineral Resources are subdivided, and must be so reported, in order of increasing confidence in respect of geoscientific evidence, into Inferred, Indicated or Measured categories. Geological evidence and knowledge required for the estimation of Mineral Resources must include sampling data of a type, and at spacings, appropriate to the geological, chemical, physical, and mineralogical complexity of the mineral occurrence, for all classifications of Inferred, Indicated and Measured Mineral Resources.

An **'Inferred Mineral Resource'** is that part of a Mineral Resource for which quantity and grade or quality are estimated on the basis of limited geological evidence and sampling. Geological evidence is sufficient to imply but not verify geological and grade or quality continuity. An Inferred Resource has a lower level of confidence than that applying to an Indicated Mineral Resource and must not be converted to a Mineral Reserve. It is reasonably expected that the majority of Inferred Mineral Resources could be upgraded to Indicated Mineral Resources with continued exploration.

An **'Indicated Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape and physical characteristics are estimated with sufficient confidence to allow the application of Modifying Factors in sufficient detail to support mine planning and evaluation of the economic viability of the deposit. Geological evidence is derived from adequately detailed and reliable exploration, sampling and testing and is sufficient to assume geological and grade or quality continuity between points of observation. An Indicated Mineral Resource has a lower level of confidence than that applying to a Measured Mineral Resource and may only be converted to a Probable Mineral Reserve. An Indicated Mineral Resource has a higher level of confidence than that applying to an Inferred Mineral Resource.

# Mineral Resource and Mineral Reserve definitions

A **'Measured Mineral Resource'** is that part of a Mineral Resource for which quantity, grade or quality, densities, shape, and physical characteristics are estimated with confidence sufficient to allow the application of Modifying Factors to support detailed mine planning and final evaluation of the economic viability of the deposit. Geological evidence is derived from detailed and reliable exploration, sampling and testing and is sufficient to confirm geological and grade or quality continuity between points of observation. A Measured Mineral Resource has a higher level of confidence than that applying to either an Indicated Mineral Resource or an Inferred Mineral Resource. It may be converted to a Proved Mineral Reserve or to a Probable Mineral Reserve.

A **'Mineral Reserve'** is the economically mineable part of a Measured and/or Indicated Mineral Resource. It includes diluting materials and allowances for losses, which may occur when the material is mined or extracted and is defined by studies at pre-feasibility or feasibility level as appropriate that include application of Modifying Factors. Such studies demonstrate that, at the time of reporting, extraction could reasonably be justified. The reference point at which Mineral Reserves are defined, usually the point where the ore is delivered to the processing plant, must be stated. It is important that, in all situations where the reference point is different, such as for a saleable product, a clarifying statement is included to ensure that the reader is fully informed as to what is being reported.

A **'Probable Mineral Reserve'** is the economically mineable part of an Indicated, and in some circumstances, a Measured Mineral Resource. The confidence in the Modifying Factors applying to a Probable Mineral Reserve is lower than that applying to a Proved Mineral Reserve.

A **'Proved Mineral Reserve'** is the economically mineable part of a Measured Mineral Resource. A Proved Mineral Reserve implies a high degree of confidence in the Modifying Factors.

**'SAMVAL Code'** – The South African Code for the reporting of Mineral Asset Valuation (the SAMVAL Code or 'the Code') sets out minimum standards and guidelines for Reporting of Mineral Asset Valuation in South Africa. The process for establishing the SAMVAL Code was initiated through an open meeting at a colloquium convened by the Southern African Institute of Mining and Minerals (SAIMM) in March 2002. The first edition of the SAMVAL Code was released in April 2008, with further amendments in July 2009. After various discussions it became apparent that a review process was required, and this was initiated in September 2011 at an open meeting at which participants were invited to express their opinions on matters that were unclear, or that required inclusion/exclusion or modification, in the 2008 edition and this resulted in the recent update released in May 2016.

A **'Competent Valuator'** (CV) is a person who is registered with ECSA, SACNASP, or SAGC, or is a Member or Fellow of the SAIMM, the GSSA, SAICA, or a Recognised Professional Organisation (RPO) or other organisations recognised by the SSC on behalf of the JSE Limited. A Competent Valuator is a person who possesses the necessary qualifications, ability, and relevant experience in valuing mineral assets. A person called upon to sign as a Competent Valuator shall be clearly satisfied in their own mind that they are able to face their peers and demonstrate competence in the valuation undertaken.

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